

Material Safety Data Sheet

1,1'-Diethyl-2,2'-Cyanine Iodide, 99% (UV-Vis)

ACC# 75953

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,1'-Diethyl-2,2'-Cyanine Iodide, 99% (UV-Vis)

Catalog Numbers: AC407250000, AC407255000, EK1195692

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
977-96-8	Quinolinium,1-ethyl-2-(1-ethyl-2(1h)-quinolinylidene)methyl,	99	213-556-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark red crystals.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Light sensitive. May cause reproductive and fetal effects. The toxicological properties of this material have not been fully investigated.

Target Organs: Thyroid.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Chronic ingestion of iodides during pregnancy

has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms could include skin rash, running nose and headache.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Quinolinium,1-ethyl-2-(1-ethyl-2(1h)-quinolinylidene)methyl,	none listed	none listed	none listed

OSHA Vacated PELs: Quinolinium,1-ethyl-2-(1-ethyl-2(1h)-quinolinylidene)methyl,: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: dark red
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:273 deg C
Decomposition Temperature:> 273 deg C
Solubility: Not available.
Specific Gravity/Density:Not available.
Molecular Formula:C₂₃H₂₃N₂
Molecular Weight:454.34

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of nitrogen, carbon dioxide, hydrogen iodide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 977-96-8 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 977-96-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	TOXIC SOLID ORGANIC NOS (DIETHYL CYANINE IODIDE)
Hazard Class:		6.1
UN Number:		UN2811
Packing Group:		II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 977-96-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 977-96-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 977-96-8: No information available.

Canada - DSL/NDSL

CAS# 977-96-8 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

1,1'-Diethyl-2,2'-Dicarbocyanine Iodide, 99% (UV-Vis)

ACC# 25906

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,1'-Diethyl-2,2'-Dicarbocyanine Iodide, 99% (UV-Vis)

Catalog Numbers: AC407260000, AC407265000, ACE1347145

Synonyms: None.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
14187-31-6	Quinolinium,1-ethyl-2-5-(1-ethyl-2(1h)-quinolinylidene)-1,3p	99	238-040-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Light sensitive. May cause reproductive and fetal effects. The toxicological properties of this material have not been fully investigated.

Target Organs: Thyroid.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe

goiter, and cretinoid appearance of the newborn. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms could include skin rash, running nose and headache.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Quinolinium,1-ethyl-2-5-(1-ethyl-2(1h)-quinolinylidene)-1,3p	none listed	none listed	none listed

OSHA Vacated PELs: Quinolinium,1-ethyl-2-5-(1-ethyl-2(1h)-quinolinylidene)-1,3p: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: green

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:263-265C
Decomposition Temperature:Not available.
Solubility: Not available.
Specific Gravity/Density:Not available.
Molecular Formula:C₂₇H₂₇N₂
Molecular Weight:506.42

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of nitrogen, carbon dioxide, hydrogen iodide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 14187-31-6 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 14187-31-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 14187-31-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 14187-31-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 14187-31-6: No information available.

Canada - DSL/NDSL

CAS# 14187-31-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

1-Naphthol >98%

ACC# 26135

Section 1 - Chemical Product and Company Identification

MSDS Name: 1-Naphthol >98%

Catalog Numbers: AC128190000, AC128190050, AC128191000, AC415300000, AC415302500, 12819-5000, 41530-0010, B12281, N12-100

Synonyms: 1-Naphthalenol; alpha-Naphthol; 1-Hydroxynaphthalene; alpha-Hydroxynaphthalene.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
90-15-3	1-Naphthol	>98	201-969-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: gray or beige to brown flakes.

Warning! Causes severe eye irritation and possible eye injury. Harmful if swallowed, inhaled, or absorbed through the skin. Causes skin and respiratory tract irritation. May cause blood abnormalities. May cause liver and kidney damage.

Target Organs: Blood, kidneys, liver, eyes.

Potential Health Effects

Eye: May cause eye injury.

Skin: Causes skin irritation. Harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting

and diarrhea. May cause burns to the digestive tract. Overexposure may result in hemolytic anemia, leading to kidney failure. Symptoms include diarrhea, headache, perspiration, listlessness and

Inhalation: Harmful if inhaled. May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation.

Chronic: May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Chronic inhalation, skin absorption or ingestion of naphthalene have caused severe hemolytic anemia.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 125 deg C (257.00 deg F)

Autoignition Temperature: 541 deg C (1,005.80 deg F)

Explosion Limits, Lower: .80 vol %

Upper: 5.00 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not breathe dust.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Storage under a nitrogen blanket has been recommended. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1-Naphthol	none listed	none listed	none listed

OSHA Vacated PELs: 1-Naphthol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Flakes

Appearance: gray or beige to brown

Odor: slight phenolic odor

pH: Not available.

Vapor Pressure: 1 mm Hg @ 94 deg C
Vapor Density: 4.5 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 278 - 280 deg C @ 760 mmHg
Freezing/Melting Point: 94 - 98 deg C
Decomposition Temperature: Not available.
Solubility: practically insoluble in water
Specific Gravity/Density: Not available.
Molecular Formula: C10H8O
Molecular Weight: 144.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Darkens on exposure to light.

Conditions to Avoid: Light, dust generation, exposure to air.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, acid chlorides, acid anhydrides, halogens.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, acrid smoke and fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 90-15-3: QL2800000

LD50/LC50:

CAS# 90-15-3:

- Draize test, rabbit, eye: 1 mg Severe;
- Draize test, rabbit, skin: 500 mg/24H Severe;
- Inhalation, rat: LC50 = >420 mg/m³/1H;
- Oral, mouse: LD50 = 275 mg/kg;
- Oral, mouse: LD50 = 275 mg/kg;
- Oral, rabbit: LD50 = 9 gm/kg;
- Oral, rabbit: LD50 = 9000 mg/kg;
- Oral, rat: LD50 = 1870 mg/kg;
- Oral, rat: LD50 = 2000 mg/kg;
- Skin, rabbit: LD50 = 880 mg/kg;
- Skin, rabbit: LD50 = 880 mg/kg;

Carcinogenicity:

CAS# 90-15-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: 1-Naphthol was not teratogenic when tested in mice or rats. The rat study used doses as high as 5% in the diet, which produced mild maternal toxicity but no effects on the offspring.

Reproductive Effects: No data available.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	CORROSIVE SOLID NOS (1-NAPHTHOL)
Hazard Class:	6.1	8
UN Number:	UN2811	UN1759
Packing Group:	III	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 90-15-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 90-15-3: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 90-15-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

R 37/38 Irritating to respiratory system and skin.

R 41 Risk of serious damage to eyes.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 90-15-3: 1

Canada - DSL/NDSL

CAS# 90-15-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 90-15-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

1-Nitroso-2-naphthol, 98%

ACC# 16094

Section 1 - Chemical Product and Company Identification

MSDS Name: 1-Nitroso-2-naphthol, 98%

Catalog Numbers: AC151530000, AC151530250, AC151531000, AC151535000

Synonyms: 1-Nitroso-2-naftol; Nitroso-beta-naphthol; alpha-Nitroso-beta-naphthol.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
131-91-9	1-Nitroso-2-naphthol	98	205-043-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown powder.

Caution! May cause eye, skin, and respiratory tract irritation. Danger of cumulative effects. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1-Nitroso-2-naphthol	none listed	none listed	none listed

OSHA Vacated PELs: 1-Nitroso-2-naphthol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: brown

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 106.00 - 108.00 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: Not available.

Molecular Formula:C10H7NO2

Molecular Weight:173.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents, strong bases.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 131-91-9: QL4725000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 131-91-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms:

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 131-91-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 131-91-9: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 131-91-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 33 Danger of cumulative effects.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 131-91-9: No information available.

Canada - DSL/NDSL

CAS# 131-91-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

2,4-Dinitrophenol, moistened with up to 35% water

ACC# 65133

Section 1 - Chemical Product and Company Identification

MSDS Name: 2,4-Dinitrophenol, moistened with up to 35% water

Catalog Numbers: AC117040000, AC117040010, AC117040050, AC117042500

Synonyms: alpha-Dinitrophenol; Dinofan; 1-Hydroxy-2,4-dinitrobenzene; Solfo Black.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
51-28-5	2,4-Dinitrophenol	>65	200-087-7
7732-18-5	Water	<35	231-791-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown.

Danger! Explosive when dry. Flammable solid. May be fatal if inhaled or swallowed. Harmful if absorbed through the skin. Causes eye, skin, and respiratory tract irritation. Marine pollutant.

Target Organs: Kidneys, heart, central nervous system, liver, reproductive system.

Potential Health Effects

Eye: Causes eye irritation. A worker accidentally sprayed dinitrophenol into his eye. Chemical conjunctivitis developed and it was treated with Blinex, Neosporin ophthalmic ointment, and an eye patch. His vision was impaired for one month.

Skin: Causes skin irritation. Harmful if absorbed through the skin. 2,4-Dinitrophenol causes maculopapular dermatitis. Dermatitis may be due to either primary irritation or allergic sensitivity.

Ingestion: May be fatal if swallowed. The metabolic rate of the poisoned individual can increase markedly, and the body temperature is elevated. Dinitrophenol exerts its toxic

effects by a general disturbance of cell metabolism resulting in a need to consume excessive amounts of oxygen in order to synthesize the essential adenine nucleotide required for cell survival in the brain, heart, and muscles.

Inhalation: May be fatal if inhaled. Causes respiratory tract irritation. May cause effects similar to those described for ingestion. Signs and symptoms of acute poisoning in humans include nausea, restlessness, flushed skin, sweating, rapid respiration, tachycardia, fever, cyanosis, and finally, collapse and coma. If the acute phase of poisoning is survived, the patient usually tolerates later complications, which may include renal insufficiency and toxic hepatitis.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause reproductive and fetal effects. 2,4-Dinitrophenol signs and symptoms are fever/hyperthermia, skin discoloration, acidosis (metabolic, delayed), hypotension, cataract (subcapsular), hearing impairment

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material poses an explosion hazard when dry. Flammable solid.

Extinguishing Media: If water is the only media available, use in flooding amounts. For large fires flood fire with water from a distance.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 2; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Reduce airborne dust and prevent scattering by moistening with water. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Use a spark-proof tool. If the material is dry, explosives experts may be necessary to dispose of the spill. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Ground and bond containers when transferring material. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not ingest or inhale. Store protected from light. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Store in a cool place in the original container and protect from sunlight. Store in a tightly closed container. Material can ignite if dry. Do not allow material to completely dry. Keep container closed to prevent drying out.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2,4-Dinitrophenol	none listed	none listed	none listed
Water	none listed	none listed	none listed
Dinitrophenol (mixed isomers)	none listed	none listed	none listed

OSHA Vacated PELs: 2,4-Dinitrophenol: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical. Dinitrophenol (mixed isomers): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Use chemical splash and impact-rated goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow to brown

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 6.35

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 114-115 deg C

Decomposition Temperature: Not available.

Solubility: Slightly soluble.

Specific Gravity/Density: 1.683

Molecular Formula: C₆H₄N₂O₅

Molecular Weight: 184.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, light, ignition sources, dehydrating agents.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, acid chlorides, acid anhydrides, and light. Forms explosive salts with alkalis and ammonia.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 51-28-5: SL2800000

CAS# 7732-18-5: ZC0110000

CAS# 25550-58-7: SL2625000

LD50/LC50:

CAS# 51-28-5:

Draize test, rabbit, skin: 300 mg/4W (Intermittent) Mild;

Oral, mouse: LD50 = 45 mg/kg;

Oral, mouse: LD50 = 72 mg/kg;

Oral, rabbit: LD50 = 30 mg/kg;
Oral, rat: LD50 = 30 mg/kg;

CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;

CAS# 25550-58-7:

Lethal doses for orally ingested 2,4-dinitrophenol in humans have been reported to be 14 to 43 mg/kg.

Carcinogenicity:

CAS# 51-28-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 25550-58-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: May cause reproductive effects.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Dinitrophenol is used as an insecticide and as a wood preservative. All nitrophenols inhibit the microbial growth of natural aquatic systems because they uncouple the metabolic process of oxidative phosphorylation.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: CAS# 51-28-5: waste number P048.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DINITROPHENOL, WETTED	2,4-DINITROPHENOL
Hazard Class:	4.1	4.1(6.1)
UN Number:	UN1320	UN1320
Packing Group:	I	I
Additional Info:		WETTED 15%

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 51-28-5 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 25550-58-7 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 51-28-5: 10 lb final RQ; 4.54 kg final RQ CAS# 25550-58-7: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 51-28-5: immediate, fire.

Section 313

This material contains 2,4-Dinitrophenol (CAS# 51-28-5, >65%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

CAS# 51-28-5 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 51-28-5 is listed as a Hazardous Substance under the CWA. CAS# 51-28-5 is listed as a Priority Pollutant under the Clean Water Act. CAS# 51-28-5 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 51-28-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 25550-58-7 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T F N

Risk Phrases:

R 1 Explosive when dry.

R 11 Highly flammable.

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 33 Danger of cumulative effects.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 28A After contact with skin, wash immediately with plenty of water

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 51-28-5: No information available.

CAS# 7732-18-5: No information available.

CAS# 25550-58-7: No information available.

Canada - DSL/NDSL

CAS# 51-28-5 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D1A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 51-28-5 is listed on the Canadian Ingredient Disclosure List.

CAS# 25550-58-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

2,4-Dinitrofluorobenzene

ACC# 91831

Section 1 - Chemical Product and Company Identification

MSDS Name: 2,4-Dinitrofluorobenzene

Catalog Numbers: AC117030000, AC117030050, AC117030250, AC117031000

Synonyms: 1-Fluoro-2,4-dinitrobenzene; Sanger's reagent; FDNB; DNFB.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
70-34-8	2,4-Dinitrofluorobenzene	98	200-734-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid or liquid.

Danger! May be fatal if absorbed through the skin or swallowed. Vesicant (agent that induces blistering). Causes eye and skin irritation and possible burns. Causes digestive and respiratory tract irritation with possible burns. May cause allergic respiratory and skin reaction.

Target Organs: Central nervous system, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation and possible burns.

Skin: Causes severe skin irritation. May be fatal if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. This material is a vesicant, that is, it will induce blistering.

Ingestion: May be fatal if swallowed. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause central nervous system effects. Ingestion of large amounts of fluoride may cause salivation, nausea, vomiting, abdominal pain, fever, labored breathing. Exposure to fluoride compounds can result in systemic toxic effects on

the heart, liver, and kidneys. It may also deplete calcium levels in the body leading to hypocalcemia and death. Acute oral toxicity tests have shown lethality with central nervous system signs in mice.

Inhalation: May cause allergic respiratory reaction. May cause severe irritation of the respiratory tract with possible burns.

Chronic: Chronic inhalation and ingestion may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Repeated exposure may cause central nervous system damage. Chronic exposure to fluoride compounds may cause systemic toxicity.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: POISON material. In case of contact, get medical aid immediately. Immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: POISON material. If swallowed, get medical aid immediately. Only induce vomiting if directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Violently decomposes when heated under confinement.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: > 112 deg C (> 233.60 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective

Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Provide ventilation. Evacuate unnecessary personnel. Keep unnecessary and unprotected personnel away.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Use only with adequate ventilation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2,4-Dinitrofluorobenzene	none listed	none listed	none listed

OSHA Vacated PELs: 2,4-Dinitrofluorobenzene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid or liquid

Appearance: yellow

Odor: acrid odor

pH: Not available.

Vapor Pressure: 0.00135 mm Hg @ 25 deg C

Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 296 deg C
Freezing/Melting Point:23-26 deg C
Decomposition Temperature:Not available.
Solubility: insoluble
Specific Gravity/Density:1.480 g/cm3
Molecular Formula:C6H3FN2O4
Molecular Weight:186.10

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Excess heat, Solution in ether may explode when evaporated., confined spaces.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, hydrogen fluoride gas.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 70-34-8: CZ7800000
LD50/LC50:
Not available.
Rat LDLo Oral: 50 mg/kg (RTECS)., Mouse LDLo Skin: 100 mg/kg (RTECS)., Mouse LD50 Oral: 25-50 mg/kg lethality with CNS signs (Eastman Kodak)
Carcinogenicity:
CAS# 70-34-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLID ORGANIC NOS (FLUORODINITROBENZENE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 70-34-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 70-34-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 70-34-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 33 Danger of cumulative effects.

R 42/43 May cause sensitization by inhalation and skin contact.

R 44 Risk of explosion if heated under confinement.

Safety Phrases:

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 70-34-8: No information available.

Canada - DSL/NDSL

CAS# 70-34-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

4-Hydroxybenzoic acid, 99%

ACC# 96167

Section 1 - Chemical Product and Company Identification

MSDS Name: 4-Hydroxybenzoic acid, 99%

Catalog Numbers: AC120990000, AC120995000, 12099-0010, 12099-1000

Synonyms: 4-Carboxyphenol; p-Hydroxybenzoic acid; p-Salicylic acid

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
99-96-7	4-Hydroxybenzoic acid, 99%	99.0	202-804-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white crystalline powder.

Caution! May cause severe eye irritation and possible injury. May cause skin irritation. May cause respiratory and digestive tract irritation. Ingestion of high doses may cause systemic effects.

Target Organs: None.

Potential Health Effects

Eye: May cause severe eye irritation. May result in corneal injury.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. Ingestion of large amounts may cause systemic effects such as nausea, stomach pain, rapid breathing, sweating, convulsions, coma, cardiovascular collapse and possible death.

Inhalation: Dust is irritating to the respiratory tract. May cause effects similar to those described for ingestion.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep container closed when not in use.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
4-Hydroxybenzoic acid, 99%	none listed	none listed	none listed

OSHA Vacated PELs: 4-Hydroxybenzoic acid, 99%: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves and clothing to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white to off-white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: @ 760.00mm Hg

Freezing/Melting Point: 215.00 - 217.00 deg C

Decomposition Temperature: Not available.

Solubility: Slightly soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₇H₆O₃

Molecular Weight: 138.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 99-96-7: DH1925000

LD50/LC50:

CAS# 99-96-7:

Oral, mouse: LD50 = 2200 mg/kg;

Oral, rat: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 99-96-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 99-96-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 99-96-7: fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 99-96-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 99-96-7: 1

Canada - DSL/NDSL

CAS# 99-96-7 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Acetamide

ACC# 00110

Section 1 - Chemical Product and Company Identification

MSDS Name: Acetamide

Catalog Numbers: AC102240000, AC102241000, AC102245000, AC153630000, AC153630050, AC153631000, AC153635000, S70042, S70045, S75020, S75021, A4-250, A4-500

Synonyms: Acetic acid amide; Ethanamide; Methanecarboxamide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-35-5	Acetamide	>99	200-473-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Warning! Possible cancer hazard. May cause cancer based on animal data. Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, liver.

Potential Health Effects

Eye: May cause eye irritation.

Skin: Causes mild skin irritation. May be harmful if absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause kidney injury. May cause cancer according to animal studies. Limited evidence of a carcinogenic effect.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Water or foam may cause frothing. Use dry chemical or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and

clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acetamide	none listed	none listed	none listed

OSHA Vacated PELs: Acetamide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: characteristic odor

pH: Not available.

Vapor Pressure: 1.33 hPa @ 65 deg C

Vapor Density: ~2

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 221 deg C

Freezing/Melting Point: 79 - 81 deg C

Decomposition Temperature: Not available.

Solubility: 2000 g/L (20°C)

Specific Gravity/Density: 1.16

Molecular Formula: C₂H₅NO

Molecular Weight: 59.06

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Metals, strong oxidizing agents, strong reducing agents, strong acids, strong bases, halogenated agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide, ammonia.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 60-35-5: AB4025000

LD50/LC50:

CAS# 60-35-5:

Oral, mouse: LD50 = 12900 mg/kg;

Oral, rat: LD50 = 7 gm/kg;

Carcinogenicity:

CAS# 60-35-5:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 1/1/90
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: IARC Group 2B: Proven animal carcinogenic substance of potential relevance to humans.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Terrestrial: Very high leachability due to its solubility. Aquatic: Readily

biodegrades. Atmospheric: Exists as an aerosol and is removed by wet deposition. Not expected to bioconcentrate.

Physical: No information available.

Other: For more information, see "HANDBOOK OF ENVIRONMENTAL FATE AND EXPOSURE DATA."

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-35-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 60-35-5: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 60-35-5: delayed.

Section 313

This material contains Acetamide (CAS# 60-35-5, >99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 60-35-5 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-35-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Acetamide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 60-35-5: 10 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 60-35-5: 1

Canada - DSL/NDSL

CAS# 60-35-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Acetanilide

ACC# 00115

Section 1 - Chemical Product and Company Identification

MSDS Name: Acetanilide

Catalog Numbers: AC150810000, AC150810050, AC150810051, AC400050250, AC400051000, 15081-0010, 15081-2500, 15081-5000, O1013-250

Synonyms: N-Phenylacetamide

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
103-84-4	Acetanilide	100	203-150-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white glistening crystals. solid.

Warning! May cause eye, skin, and respiratory tract irritation. May cause allergic skin reaction. May be harmful if swallowed. May cause blood abnormalities. May cause central nervous system effects.

Target Organs: Blood, kidneys, central nervous system, skin.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause

kidney damage. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Human systemic effects by ingestion may include: visual field changes, tinnitus, and nausea or vomiting. May cause hallucinations and distorted perceptions. Ingestion may cause kidney damage including acute tubular necrosis and acute renal failure.

Inhalation: May cause respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause effects similar to those described for ingestion. Coal tar analgetics including acetanilide are depressants of the central nervous system.

Chronic: Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Will burn if involved in a fire. Dust can be an explosion hazard when exposed to heat or flame. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. Use water spray to cool fire-exposed containers.

Flash Point: 173 deg C (343.40 deg F)

Autoignition Temperature: 545 deg C (1,013.00 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep away from heat and flame. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong bases.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acetanilide	none listed	none listed	none listed

OSHA Vacated PELs: Acetanilide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white glistening crystals.
Odor: Not available.
pH: Not available.
Vapor Pressure: 1 mm Hg @237 deg F
Vapor Density: 4.65 (air=1)
Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: 304 deg C @ 760 mmHg
Freezing/Melting Point:113 - 115 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble.
Specific Gravity/Density:1.21
Molecular Formula:C₈H₉NO
Molecular Weight:135.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 103-84-4: AD7350000
LD50/LC50:
CAS# 103-84-4:
Oral, mouse: LD50 = 1210 mg/kg;
Oral, rat: LD50 = 800 mg/kg;

Carcinogenicity:
CAS# 103-84-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Micronucleus test(Intraperitoneal,mouse) = 50 mg/kg
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 100 mg/L; 96 Hr.; Static, 23 degrees C No data available.

Environmental: An estimated BCF value of 4.5 was calculated for acetanilide, using an experimental log Kow of 1.16. According to a classification scheme, this BCF value suggests that bioconcentration in aquatic organisms is low.

Physical: Acetanilide is not expected to undergo hydrolysis or direct photolysis in the environment due to the lack of functional groups to hydrolyze or absorb UV light.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 103-84-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 103-84-4: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 103-84-4 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 103-84-4: 1

Canada - DSL/NDSL

CAS# 103-84-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Fuchsin Acid

ACC# 10082

Section 1 - Chemical Product and Company Identification

MSDS Name: Fuchsin Acid

Catalog Numbers: F97-25

Synonyms: Acid fuchsine; Acid magenta; Fushine acid; CI 42685; Acid violet 19.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
3244-88-0	Fuchsin Acid	100	221-816-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray, dry chemical, or carbon dioxide. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Fuchsin Acid	none listed	none listed	none listed

OSHA Vacated PELs: Fuchsin Acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green

Odor: none reported

pH: Acidic.

Vapor Pressure: Negligible.

Vapor Density: 20.2

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature:Not available.

Solubility: 14% in water.

Specific Gravity/Density:Not available.

Molecular Formula:C₂₀H₁₇N₃O₉S₃Na₂

Molecular Weight:585.2933

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 3244-88-0: DD4737000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 3244-88-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 3244-88-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 3244-88-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 3244-88-0: No information available.

Canada - DSL/NDSL

CAS# 3244-88-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Acridine Orange, 55%

ACC# 97431

Section 1 - Chemical Product and Company Identification

MSDS Name: Acridine Orange, 55%

Catalog Numbers: AC300910000, AC300910250, AC300911000

Synonyms: 3,6-Acridinediamine.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10127-02-3	Acridine Orange	55	233-353-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange solid.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if swallowed, inhaled, or absorbed through the skin. Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. Harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Harmful if inhaled. Causes respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acridine Orange	none listed	none listed	none listed

OSHA Vacated PELs: Acridine Orange: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: orange

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₇H₂₀N₃Cl_{1.5}ZnCl₂

Molecular Weight: 369.94

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10127-02-3 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10127-02-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DYES, SOLID, TOXIC, N.O.S.	No information available.
Hazard Class:	6.1	
UN Number:	UN3143	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10127-02-3 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Acridine Orange (listed as Zinc compounds), 55%, (CAS# 10127-02-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 10127-02-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10127-02-3 can be found on the following state right to know lists: California, (listed as Zinc compounds), New Jersey, (listed as Zinc compounds), Pennsylvania, (listed as Zinc compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 10127-02-3: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10127-02-3 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Albumin, egg (powder)

ACC# 00093

Section 1 - Chemical Product and Company Identification

MSDS Name: Albumin, egg (powder)

Catalog Numbers: AC400450000, AC400450500, 40045-1000, 40045-5000

Synonyms: Egg albumin; Egg white.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9006-59-1	Albumin egg	100	232-692-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine powder.

Caution! May cause eye, skin, and respiratory tract irritation. Heat sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Treat symptomatically and supportively. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion

and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Albumin egg	none listed	none listed	none listed

OSHA Vacated PELs: Albumin egg: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow-white - fine

Odor: Not available.

pH: 6 - 8

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 61 deg C @ 760 mm Hg

Freezing/Melting Point: 0 deg C

Decomposition Temperature: 60 deg C

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9006-59-1: AY9384000

LD50/LC50:

CAS# 9006-59-1:

Oral, mouse: LD50 = >24 gm/kg;

Carcinogenicity:

CAS# 9006-59-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9006-59-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9006-59-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9006-59-1: No information available.

Canada - DSL/NDSL

CAS# 9006-59-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Alcian Blue 8GX

ACC# 96162

Section 1 - Chemical Product and Company Identification

MSDS Name: Alcian Blue 8GX

Catalog Numbers: AC190270000, AC190270250

Synonyms: Ingrain Blue; Copper(4+),n,n',n'',n'''-29h,31h-phthalocyaninetetrayl tetra.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
33864-99-2	Alcian Blue 8GX	>98	251-705-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple-blue powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. Repeated or prolonged exposure may cause drying and cracking of the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alcian Blue 8GX	none listed	1 mg/m ³ TWA (dust and mist, as Cu, except copper fume) (listed under Copper compounds, n.o.s.).100 mg/m ³ IDLH (dust and mist, as Cu) (listed under Copper compounds, n.o.s.).	none listed

OSHA Vacated PELs: Alcian Blue 8GX: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: purple-blue
Odor: none reported
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 148 deg C
Decomposition Temperature: Not available.
Solubility: moderately soluble
Specific Gravity/Density: Not available.
Molecular Formula: C₅₆H₆₈Cl₄CuN₁₆S₄
Molecular Weight: 1298.88

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 33864-99-2 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 33864-99-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 33864-99-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Alcian Blue 8GX (listed as Copper compounds, n.o.s.), >98%, (CAS# 33864-99-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 33864-99-2 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 33864-99-2 can be found on the following state right to know lists: California, (listed as Copper compounds, n.o.s.), New Jersey, (listed as Copper compounds, n.o.s.), Pennsylvania, (listed as Copper compounds, n.o.s.).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 33864-99-2: No information available.

Canada - DSL/NDSL

CAS# 33864-99-2 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 33864-99-2 (listed as Copper compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

Material Safety Data Sheet

Alizarin, 97%

ACC# 44579

Section 1 - Chemical Product and Company Identification

MSDS Name: Alizarin, 97%

Catalog Numbers: AC153690000, AC153690250, AC153691000, AC153695000

Synonyms: 1,2-Dihydroxy-9,10-Anthraquinone; 1,2-Dihydroxyanthrquinone; CI 58000.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
72-48-0	Alizarin	97	200-782-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange solid.

Caution! May cause respiratory and digestive tract irritation. May cause eye and skin irritation. Prolonged or repeated contact causes defatting of the skin with irritation, dryness, and cracking.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alizarin	none listed	none listed	none listed

OSHA Vacated PELs: Alizarin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: orange
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 430 deg C
Freezing/Melting Point:290 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble in
Specific Gravity/Density:Not available.
Molecular Formula:C14H8O4
Molecular Weight:240.0536

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents and bases.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 72-48-0: CB6580000
LD50/LC50:
CAS# 72-48-0:
Draize test, rabbit, eye: 500 mg/24H Mild;

Carcinogenicity:
CAS# 72-48-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Mutation data has been reported.
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 72-48-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 72-48-0: fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 72-48-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 72-48-0: No information available.

Canada - DSL/NDSL

CAS# 72-48-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 72-48-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Alizarin Yellow GG

ACC# 83808

Section 1 - Chemical Product and Company Identification

MSDS Name: Alizarin Yellow GG

Catalog Numbers: AC195690000, AC195690250

Synonyms: C.I. 14025; Mordant Yellow 1, 5-(M-Nitrophenylazo)salicylic Acid, Sodium Salt.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
584-42-9	Alizarin Yellow GG	ca 100	209-536-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slightly brown powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective

Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alizarin Yellow GG	none listed	none listed	none listed

OSHA Vacated PELs: Alizarin Yellow GG: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: slightly brown
Odor: None reported.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: soluble in cold water
Specific Gravity/Density:Not available.
Molecular Formula:C₁₃H₈N₃O₅Na
Molecular Weight:309.20

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of nitrogen, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 584-42-9: DH2528550
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 584-42-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 584-42-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 584-42-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 584-42-9: No information available.

Canada - DSL/NDSL

CAS# 584-42-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Alizarin Yellow R Indicator

ACC# 76898

Section 1 - Chemical Product and Company Identification

MSDS Name: Alizarin Yellow R Indicator

Catalog Numbers: S71374, S71910, S93109

Synonyms: Alizarin Yellow R Sodium Salt; 5-(P-Nitrophenylazo) Salicylic Acid Sodium Salt; Sodium P-Nitrobenzeneazosalicylate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1718-34-9	Alizarin Yellow R Sodium Salt	100.0	217-002-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown yellow, red brown or brown solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alizarian Yellow R Sodium Salt	none listed	none listed	none listed

OSHA Vacated PELs: Alizarian Yellow R Sodium Salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: brown yellow, red brown or brown
Odor: Odorless
pH: Not available.
Vapor Pressure: Negligible
Vapor Density: 10.7
Evaporation Rate: Negligible
Viscosity: Not available.
Boiling Point: Decomposes
Freezing/Melting Point: 250 deg C
Decomposition Temperature: Not available.
Solubility: Soluble in water
Specific Gravity/Density: >1.0
Molecular Formula: $4\text{NO}_2\text{C}_6\text{H}_4\text{N}_2\text{C}_6\text{H}_3\text{C}_3\text{Na}_1\text{2O}_3\text{H}_3$
Molecular Weight: 635.1811

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 1718-34-9: DH2528600
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 1718-34-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1718-34-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1718-34-9: reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1718-34-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 1718-34-9: No information available.

Canada - DSL/NDSL

CAS# 1718-34-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those

regulations.

Canadian Ingredient Disclosure List

FISHER SCIENTIFIC -- ALUMINA(ACTIVATED/ADSORPTION/DRY POWDER/ACID/BASIC/NEUTRAL/P --
6850-00-130-2683

=====
Product Identification
=====

Product ID:ALUMINA(ACTIVATED/ADSORPTION/DRY POWDER/ACID/BASIC/NEUTRAL/P
MSDS Date:02/09/1997
FSC:6850
NIIN:00-130-2683
MSDS Number: CJVCZ
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:ONE REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:800-766-7000; 201-796-7100
Emergency Phone Num:201-796-7100
Chemtrec Ind/Phone:(800)424-9300
CAGE:1B464

=== Contractor Identification ===

Company Name:AMERICO INDUSTRIAL SUPPLY INC
Address:1070 E DOMINGUEZ ST UNIT B
Box:City:CARSON
State:CA
ZIP:90746-3619
Country:US
Phone:310-763-5500 FAX:310-763-5858
Contract Num:SP0450-00-M-D180
CAGE:0XDR8
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:ALUMINUM OXIDE
CAS:1344-28-1
RTECS #:BD1200000
= Wt:100.
OSHA PEL:15 MG/M3
ACGIH TLV:10 MG/M3

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYES:DUST MAY CAUSE MECHANICAL
IRRITATION. SKIN: DUST MAY CAUSE MECHANICAL IRRITATION. LOW HAZARD
FOR USUAL INDUSTRIAL HANDLING. INGESTED: INGESTION OF LARGE AMOUNTS

MAY CAUSE GASTROINTESTINAL IRRITATION. EXPECTED TO BE A LOW INGESTION HAZARD. INHALATION: MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE LUNG DAMAGE. CHRONIC: CHRONIC INHALATION OF FINE DUSTS MAY CAUSE LUNG DAMAGE.

Explanation of Carcinogenicity: NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.

Effects of Overexposure: EYE: DUST MAY CAUSE MECHANICAL IRRITATION.

SKIN: DUST MAY CAUSE MECHANICAL IRRITATION. LOW HAZARD FOR USUAL INDUSTRIAL HANDLING. INGESTION: INGESTION OF LARGE AMOUNTS MAY CAUSE GASTROINTESTINAL IRRITATION. EXPECTED TO BE A LOW INGESTION HAZARD. INHALATION: MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE LUNG DAMAGE.

Medical Condition Aggravated by Exposure: NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid: EYES: FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER & LOWER LIDS. GET MEDICAL AID. SKIN: FLUSH SKIN WITH PLENTY OF SOAP & WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING & SHOES. GET MEDICAL AID IF IRRITATION DEVELOPS OR PERSISTS. INGESTION: IF VICTIM IS CONSCIOUS AND ALERT, GIVE 2-4 CUPFULS OF MILK OR WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL AID. INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL AID IF COUGH OR OTHER SYMPTOMS APPEAR

=====
===== Fire Fighting Measures =====

Lower Limits: N/A

Upper Limits: N/A

Extinguishing Media: SUBSTANCE IS NONCOMBUSTIBLE; USE AGENT MOST APPROPRIATE TO EXTINGUISH SURROUNDING FIRE.

Fire Fighting Procedures: AS IN ANY FIRE, WEAR A SELF-CONTAINED BREATHING APPARATUS IN PRESSURE-DEMAND, MSHA/NIOSH (APPROVED OR EQUIVALENT), AND FULL PROTECTIVE GEAR.

=====
===== Accidental Release Measures =====

Spill Release Procedures: VACUUM OR SWEEP UP MATERIAL AND PLACE INTO A SUITABLE DISPOSAL CONTAINER. AVOID GENERATING DUSTY CONDITIONS.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions: USE WITH ADEQUATE VENTILATION. MINIMIZE DUST GENERATION AND ACCUMULATION. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. AVOID CONTACT WITH EYES. AVOID INGESTION AND INHALATION. STORE IN A TIGHTLY CLOSED CONTAINER. STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE SUBSTANCES

Other Precautions: CAUTION! MAY CAUSE RESPIRATORY AND DIGESTIVE TRACT IRRITATION. MAY CAUSE LUNG DAMAGE. MAY CAUSE MECHANICAL EYE AND SKIN IRRITATION. TARGET ORGANS: LUNGS.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: FOLLOW THE OSHA RESPIRATOR REGULATIONS FOUND IN

29CFR 1910.134 OR EUROPEAN STANDARD EN 149. ALWAYS USE A NIOSH OR EUROPEAN STANDARD EN 149 APPROVED RESPIRATOR WHEN NECESSARY.
Protective Gloves:WEAR APPROPRIATE GLOVES TO PREVENT SKIN EXPOSURE.
Eye Protection:WEAR APPROPRIATE PROTECTIVE EYEGLASSES OR CHEMICAL SAFETY GOGGLES.
Other Protective Equipment:WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT SKIN EXPOSURE.
Supplemental Safety and Health
NOTES TO PHYSICIAN: TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ANTIDOTE: NONE REPORTED.

===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:=2980.C, 5396.F
Melt/Freeze Pt:=2000.C, #####F
Decomp Temp:Decomp Text:N/AV
Vapor Pres:NEGLIGIBLE
Vapor Density:N/AV
Spec Gravity:4.0 (WATER =1)
pH:N/AV
Viscosity:N/AV
Evaporation Rate & Reference:N/AV
Solubility in Water:NEGLIGIBLE IN WATER
Appearance and Odor:SOLID, WHITE, ODORLESS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
REACTS WITH CHLORINE TRIFLUORIDE OR ETHYLENE OXIDE.
Stability Condition to Avoid:INCOMPATIBLE MATERIALS.
Hazardous Decomposition Products:NONE
Conditions to Avoid Polymerization:HAS NOT BEEN REPORTED

===== Toxicological Information =====

Toxicological Information:LD50/LC50: NOT AVAILABLE. CARCINOGENICITY:
ACGIH-A4=NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.
TERATOGENICITY/REPRODUCTIVE
EFFECTS/NEUROTOXICITY/MUTAGENICITY/OTHER STUDIES: NOT AVAILABLE.

===== Ecological Information =====

Ecological:ECOTOXICITY: NOT AVAILABLE. ENVIRONMENTAL FATE: NOT AVAILABLE. PHYSICAL/CHEMICAL: NOT AVAILABLE. OTHER: NOT AVAILABLE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL, STATE & LOCAL REGULATIONS. RCRA D-SERIES: NONE LISTED. RCRA F-SERIES: NONE LISTED. RCRA P-SERIES: NONE LISTED. RCRA U-SERIES: NONE LISTED. NONE LISTED AS A MATERIAL BANNED FROM LAND DISPOSAL ACCORDING TO RCRA.

===== MSDS Transport Information =====

Transport Information:US DOT: NO INFORMATION AVAILABLE. IMO: NO

INFORMATION AVAILABLE. IATA: NO INFORMATION AVAILABLE. RID/ADR: NO INFORMATION AVAILABLE. CANADIAN TDQ: NO INFORMATION AVAILABLE.

=====
===== Regulatory Information =====

SARA Title III Information:SAARA 302 RQ: NONE OF THE CHMICALS IN THIS MATERIAL HAVE AN RQ. SECTION 302 TPQ: NONE OF THE CHMICALS IN THIS MATERIAL HAVE A TPQ. SECTION 313: CONTAINS ALUMINUM OXIDE (CAS# 1344-28-1; 100%); WHICH IS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF SARA TITLE III & 40 CFR PART 373.

Federal Regulatory Information:RCRA D-SERIES: NONE LISTED. RCRA F-SERIES: NONE LISTED. RCRA P-SERIES: NONE LISTED. RCRA U-SERIES: NONE LISTED. NONE LISTED AS A MATERIAL BANNED FROM LAND DISPOSAL ACCORDING TO RCRA. TSCA: CAS# 1344- 28-1 IS LISTED ON THE TSCA INVENTORY. TSCA SNUR: NONE LISTED. CLEAN AIR ACT: THIS MATERIAL DOES NOT CONTAIN ANY HAZARDOUS AIR POLLUTERS. THIS MATERIAL DOES NOT CONTAIN ANY CLASS 1/CLASS 2 OZONE DEPLET ORS. CLEAN WATER ACT: NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS HAZARDOUS SUBSTANCES UNDER THE CWA. NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS PRIORITY POLLUTANTS UNDER THE CWA.

State Regulatory Information:ALUMINUM OXIDE CAN BE FOUND ON THE FOLLOWING STATE RIGHT TO KNOW LISTS: CALIFORNIA, NEW JERSEY, FLORIDA, PENNSYLVANIA, MINNESOTA, MASSACHUSETTS. CALIFORNIA NO SIGNIFIGANT RISK LEVEL: NONE OF THE CHEMI CALS IN THIS PRODUCT ARE LISTED.

=====
===== Other Information =====

Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

Material Safety Data Sheet

Aluminon

ACC# 00875

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminon

Catalog Numbers: S80255, S93110

Synonyms: Aurintricarboxylic acid ammonium salt;

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
569-58-4	Aluminon	100	209-319-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-brown solid.

Caution! May cause irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminon	none listed	none listed	none listed

OSHA Vacated PELs: Aluminon: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: red-brown

Odor: none reported

pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: C₂₂H₂₃N₃O₉
Molecular Weight: 473.1757

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation.
Incompatibilities with Other Materials: Strong oxidizers.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 569-58-4: GU4800000
LD50/LC50:
CAS# 569-58-4:
Oral, rat: LD50 = 9 gm/kg;

Carcinogenicity:
CAS# 569-58-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 569-58-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 569-58-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 569-58-4: No information available.

Canada - DSL/NDSL

CAS# 569-58-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Aluminum ammonium sulfate dodecahydrate

ACC# 00877

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum ammonium sulfate dodecahydrate

Catalog Numbers: AC206260000, AC206260010, AC206260025, AC206260050, AC400540000, AC400545000, A567-500

Synonyms: Ammonium alum dodecahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7784-26-1	Aluminum ammonium sulfate dodecahydrate	>97	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. May cause liver damage.

Target Organs: Liver.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver damage.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause irritation.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum ammonium sulfate dodecahydrate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed
Ammonium alum anhydrous	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum ammonium sulfate dodecahydrate: No OSHA Vacated PELs are listed for this chemical. Ammonium alum anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 120 deg C
Freezing/Melting Point: 94.4 deg C
Decomposition Temperature: 280 deg C
Solubility: 150 g/l (20 C)
Specific Gravity/Density: 1.6 (water=1)
Molecular Formula: AlNH₄S₂O₈·12H₂O
Molecular Weight: 453.2922

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: None reported.
Incompatibilities with Other Materials: None reported.
Hazardous Decomposition Products: Nitrogen oxides, oxides of sulfur, ammonia and/or derivatives.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7784-26-1: WS5640010
CAS# 7784-25-0 unlisted.
LD50/LC50:
Not available.
Not available.

Carcinogenicity:
CAS# 7784-26-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7784-25-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-26-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7784-25-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7784-26-1: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7784-26-1 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

CAS# 7784-25-0 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:**WGK (Water Danger/Protection)**

CAS# 7784-26-1: 1

CAS# 7784-25-0: No information available.

Canada - DSL/NDSL

CAS# 7784-26-1 is listed on Canada's DSL List.

CAS# 7784-25-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7784-26-1 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

CAS# 7784-25-0 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- A-581, ALUMINUM HYDROXIDE -- 6810-00N030952

=====
===== Product Identification =====

Product ID:A-581, ALUMINUM HYDROXIDE
MSDS Date:04/26/1985
FSC:6810
NIIN:00N030952
MSDS Number: BPGWL
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
CAGE:1B464

==== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:ALUMINUM HYDROXIDE
CAS:21645-51-2
RTECS #:BD0940000
Fraction by Wt: 100%
OSHA PEL:2 MG(AL)/M3
ACGIH TLV:2 MG(AL)/M3

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: INHAL: INHAL MAY PRODUCE IRRIT
& COUGHING. SKIN: SUBSTANCE HAS LOW LEVEL OF TOX. PROLONGED
EXPOSURE TO DUST MAY CAUSE IRRIT. EYE: DIRECT CONTACT MAY CAUSE
REDNESS & IRRIT. INGEST: GREATEST DANG ER FROM INGESTION OF LARGE
QTY OF THIS SUBSTANCE IS INTESTINAL OBSTRUCTION. CHRONIC: INHAL:
MAY CAUSE (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ: MUC MEMB IRRIT. SKIN: NONE REPORTED
IN HUMANS. EYE: MAY CAUSE CONJUNCTIVITIS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INHAL: REMOVE FROM EXPOS TO FRESH AIR IMMED. IF BRTHG HAS STOPPED, GIVE ARTF RESP. KEEP PERSON WARM & @ REST. GET MED ATTN. SKIN: REMOVE CONTAMD CLTHG & SHOES IMMED. WASH AFFECTED AREA W/SOAP/ MILD DE TERGENT & LG AMTS OF H2O(APPROX 15-20 MIN) UNTIL NO EVIDENCE OF CHEM REMAINS. GET MED ATTN. EYE: WASH IMMED W/LG AMTS OF H2O, OCCAS LIFT LIDS, UNTIL NO EVIDENCE OF CHEM (SUPP DATA)

=====
===== Fire Fighting Measures =====

Flash Point:NON-FLAMMABLE
Extinguishing Media:DRY CHEM, CO2, WATER SPRAY OR FOAM. FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT . MOVE CONTAINER FROM AREA IF POSSIBLE. AVOID BREATHING VAPORS OR DUSTS; KEEP UPWIND.
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE AND NEGLIGIBLE EXPLOSION HAZARD IN DUST FORM WHEN EXPOSED TO HEAT OR FLAME.

=====
===== Accidental Release Measures =====

Spill Release Procedures:ABSORB WITH VERMICULITE OR OTHER SUITABLE MATERIAL, SCOOP UP AND PLACE IN A SUITABLE CONTAINER (FIBER BOARD OR PLASTIC) FOR LATER DISPOSAL.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:NONE SPECIFIED BY MANUFACTURER.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:200 MG(AL)/M3-NIOSH/MSHA APPRVD HIGH-EFFICIENCY PARTICULATE RESPIRATOR W/FULL FACE-PIECE.
Ventilation:PROVIDE LOCAL EXHAUST VENTILATION OR GENERAL DILUTION VENTILATION TO MEET PERMISSIBLE EXPOSURE LIMITS.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:PROT CLTHG NOT REQD. AVOID REPEATED OR PROLONGED CONTACT WITH SUBSTANCE.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
HMIS(LEVIEN) NOTES THAT TDLO(HUMAN) IS 79-122MG/KG.MATL TO AVOID: W/BISMUTH HYDROXIDE & REDUCED BY HYDROGEN @ 170-210C, IT IS SPONTANEOUSLY FLAMM IN AIR @ ORDINARY TEMP. FIRST AID PROC: REMAINS (15-20 MIN). GET MED ATTN. INGEST: IF CONSCIOUS, IMMED GIVE 2-4 GLASSES OF H2O,INDUCE VOMIT BY TOUCHING FINGER BACK OF THROAT.

=====
===== Physical/Chemical Properties =====

HCC:T6
Melt/Freeze Pt:M.P/F.P Text:572F,300C
Spec Gravity:2.4
Solubility in Water:INSOLUBLE
Appearance and Odor:WHITE CRYSTALLINE POWDER, GRANULES OR GELETINOUS

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
CHLORINATED RUB: REACTS VIOLENTLY. BISMUTH HYDROXIDE & HYDROGEN: WHEN
ALUMINUM HYDROXIDE IS CO-PRECIPITATED (SUPP DATA)
Stability Condition to Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY RELEASE
ACRID SMOKE AND IRRITATING FUMES.

===== Disposal Considerations =====

Waste Disposal Methods: DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND
LOCAL REGULATIONS .

Disclaimer (provided with this information by the compiling agencies):
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of Defense. The United States of America in no manner whatsoever,
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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Aluminum nitrate

ACC# 00940

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum nitrate

Catalog Numbers: S70418, S71913, S93114

Synonyms: Aluminum trinitrate; nitric acid aluminum salt

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13473-90-0	Aluminum nitrate	100	236-751-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. May be harmful if swallowed. May cause methemoglobinemia.

Target Organs: Eyes.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis.

Skin: Causes skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.

Inhalation: May cause respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water with caution and in flooding amounts. Oxidizer. Greatly increases the burning rate of combustible materials. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Contact professional fire-fighters immediately.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not get on skin or in eyes. Avoid ingestion and inhalation. Keep from contact with clothing and other combustible materials. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from flammable liquids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum nitrate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by

OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to white

Odor: odorless

pH: Acidic in solution.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 150 deg C

Freezing/Melting Point: 73.9 deg C

Decomposition Temperature: 150 deg C

Solubility: 64 g/100ml (25°C)

Specific Gravity/Density: >1

Molecular Formula: $\text{Al}(\text{NO}_3)_3$

Molecular Weight: 212.9962

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, dust generation, combustible materials, reducing agents.

Incompatibilities with Other Materials: Reducing agents.

Hazardous Decomposition Products: Nitrogen oxides, aluminum oxide, aluminum fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:**CAS#** 13473-90-0: BD1040000**LD50/LC50:**

CAS# 13473-90-0:

Draize test, rabbit, eye: 100 mg Severe;

Draize test, rabbit, skin: 500 mg Mild;

Draize test, rabbit, skin: 10%/6D (Intermittent);

Oral, mouse: LD50 = 370 mg/kg;

Oral, rat: LD50 = 204 mg/kg;

Carcinogenicity:

CAS# 13473-90-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.**Teratogenicity:** No data available.**Reproductive Effects:** No data available.**Mutagenicity:** No data available.**Neurotoxicity:** No data available.**Other Studies:**

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ALUMINUM NITRATE	ALUMINUM NITRATE

Hazard Class:	5.1	5.1
UN Number:	UN1438	UN1438
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13473-90-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Aluminum nitrate (listed as Water Dissociable Nitrate Compounds), 100%, (CAS# 13473-90-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 13473-90-0 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), New Jersey, Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 36 Irritating to eyes.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 13473-90-0: 1

Canada - DSL/NDSL

CAS# 13473-90-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 13473-90-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Aluminum potassium sulfate dodecahydrate

ACC# 19200

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum potassium sulfate dodecahydrate

Catalog Numbers: AC217480000, AC217480010, AC217485000, AC423260000, AC423260010, AC423260030, AC423260050, AC423265000, A601-3, A601-500, A605-12, A605-212, A605-500

Synonyms: Alum; Aluminum potassium sulfate, dodecahydrate; Kalinite; Potassium alum; Sulfuric acid, aluminum potassium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7784-24-9	Aluminum potassium sulfate dodecahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Warning! Irritant. Harmful if swallowed. Causes eye and skin irritation. May cause respiratory tract irritation.

Target Organs: Eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse. Discard contaminated shoes.

Storage: Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum potassium sulfate dodecahydrate	none listed	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed
Potassium aluminum sulfate	none listed	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum potassium sulfate dodecahydrate: No OSHA Vacated PELs are listed for this chemical. Potassium aluminum sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 3.0-3.5 (10% aq soln)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: 92 deg C

Decomposition Temperature: 200 deg C

Solubility: Partially soluble.

Specific Gravity/Density: 1.757

Molecular Formula: $\text{AlK}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$

Molecular Weight: 474.3558

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Aluminum, copper, steel, zinc, strong oxidizing agents.

Hazardous Decomposition Products: Oxides of sulfur, aluminum oxide, oxides of potassium.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7784-24-9: WS5690000

CAS# 10043-67-1: WS5650000

LD50/LC50:

Not available.
Not available.

Carcinogenicity:

CAS# 7784-24-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 10043-67-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-24-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10043-67-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7784-24-9: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7784-24-9 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

CAS# 10043-67-1 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.
R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7784-24-9: No information available.
CAS# 10043-67-1: 1

Canada - DSL/NDSL

CAS# 10043-67-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7784-24-9 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.
CAS# 10043-67-1 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

SIGMA CHEMICAL CO -- ALUMINUM CHLORIDE HEXAHYDRATE, A3017 -- 6810-00N041935

=====
===== Product Identification =====

Product ID:ALUMINUM CHLORIDE HEXAHYDRATE, A3017
MSDS Date:01/30/1992
FSC:6810
NIIN:00N041935
MSDS Number: BSVBZ
=== Responsible Party ===
Company Name:SIGMA CHEMICAL CO
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178
Country:US
Info Phone Num:800-325-3010; 314-771-5750
Emergency Phone Num:314-771-5767
CAGE:21076

==== Contractor Identification ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
===== Composition/Information on Ingredients =====

Ingred Name:ING 3:STEP DECOMP RXN OCCURRING >90C, WHICH
SELF-ACCELERATES W/HIGH EXOTHERMICALLY PRDCG AZO- & AZOXYPOLYMERS.
RTECS #:9999999ZZ

Ingred Name:MATLS TO AVOID:CHLORIDE & NAPHTHALENE, MIXT OF ANILIINE &
ETHYLENEIMINE, ETHYLENE OXIDE, MIXT OF SODIUM PEROXIDE (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:& ALUMINUM. ALUMINUM CHLORIDE REACTS EXPLOSIVELY
WITH:OXYGEN DIFLUORIDE, PHENYL AZIDE, PERCHLORYL BENZENE/ (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:SODIUM BOROHYDRIDE. MIXTS OF ALUMINUM CHLORIDE &
NITROMETHANE REACT EXPLOSIVELY ON CONT W/ALKENES/CARBON (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7:MONOXIDE & PHENOL.
RTECS #:9999999ZZ

Ingred Name:WASTE DISP METH:WHICH CAN BE CONTROLLED BY THE RATE OF
ADDITION. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS.
RTECS #:9999999ZZ

Ingred Name:ALUMINUM CHLORIDE, HEXAHYDRATE

CAS:7784-13-6
RTECS #:BD0530000

Ingred Name:SUPDAT:OF DESORBED HYDROGEN CHLORIDE, BUT ALSO BY NEAR
DOUBLING IN VOL WHICH OCCURS WHEN MATL MELTS TO MONOMER. (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:MIXTS OF NITROBENZENE & ALUMINUM CHLORIDE ARE
THERMALLY UNSTABLE & MAY LEAD TO EXPLO DECOMP DUE TO MULTI- (ING 4)
RTECS #:9999999ZZ

=====
===== Hazards Identification =====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 3311 MG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:MAY BE HARMFUL BY INHALATION,
INGESTION OR SKIN ABSORPTION. CAUSES EYE & SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES & UPPER RESPIRATORY
TRACT. TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INGEST:CALL MD IMMEDIATELY . EYES:IMMEDIATELY FLUSH W/COPIOUS
AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN:IMMEDIATELY WASH
W/SOAP & COPIOUS AMOUNTS OF WATER. WASH CONTAMINATED CLOTHING
BEFORE REUSE. INHAL:REMOVE TO FRESH AIR. IF NOT BREATHING GIVE
ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
CALL MD.

=====
===== Fire Fighting Measures =====

Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL POWDER, ALCOHOL OR
POLYMER FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CNDTNS. THE
ANHYDROUS FORM OF THIS MATL HAS BEEN REPORTED TO HAVE FOLLOWING
HAZS ASSOC W/IT. PRLNG STOR OF ANHYDROUS (SUPP DATA)

=====
===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR NIOSH/MSHA APPROVED
RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS & HEAVY RUBBER
GLOVES. SWEEP UP, PLACE IN A BAG & HOLD FOR WASTE DISPOSAL. AVOID
RAISING DUST. VENTILATE AREA & WASH SPILL SITE AFTER MATL PICKUP
IS COMPLETE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:DO NOT BREATHE DUST. AVOID CONTACT
W/EYES, SKIN & CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE.

IRRITANT. HARMFUL DUST. KEEP TIGHTLY CLOSED.
Other Precautions:MOISTURE SENSITIVE. STORE IN A COOL DRY PLACE.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST REQUIRED.
Protective Gloves:CHEMICAL-RESISTANT GLOVES.
Eye Protection:ANSI APRV CHEM WORK GOGG .
Other Protective Equipment:OTHER PROTECTIVE CLOTHING. SAFETY SHOWER &
EYE BATH WHICH MEETS ANSI DESIGN CRITERIA .
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
EXPLO HAZ:ALUMINUM CHLORIDE IN CLSD CNTNRS HAS RESULTED IN SPONT DECOMP
& OCCAS EXPLO UPON OPENING CNTNR PROB DUE TO DIFFUSION OF MOISTURE
INTO CNTNR W/RESULTING PRESS BUILD-UP DUE TO LIBERATED HYDROG EN
CHLORIDE GAS. WHEN HEATED IN SEALED TUBE, HIGH INTERNAL PRESS MAY
BE GEN DUE TO NOT ONLY ITS VAP PRESS & PRESS(ING 2)

=====
===== Physical/Chemical Properties =====

HCC:T6
Vapor Pres:1 @ 100C
Spec Gravity:2.398
Appearance and Odor:MOIST WHITE CRYSTALS.

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG ACIDS. VIOLENT EXOTHERMIC RXNS CAN OCCUR UPON ALUMINUM CHLORIDE
CONTACTING:ALKENES, MIXT OF BENZOYL (ING 5)
Stability Condition to Avoid:MAY DECOMPOSE ON EXPOSURE TO MOIST AIR OR
WATER.
Hazardous Decomposition Products:HYDROGEN CHLORIDE GAS, ALUMINUM OXIDE.

=====
===== Disposal Considerations =====

Waste Disposal Methods:FOR SM QTYS:CAUTIOUSLY ADD TO LG STIRRED EXCESS
OF WATER. ADJUST PH TO NEUTRAL, SEPARATE ANY INSOL SOLIDS/LIQS &
PACKAGE THEM FOR HAZ-WASTE DISP. FLUSH AQUEOUS SOLN DOWN DRAIN
W/PLENTY OF WATER. HYDRO LYSIS & NEUT RXNS MAY GEN HEAT & FUMES
(ING 9)

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Aluminum Oxide, 99%

ACC# 95871

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum Oxide, 99%

Catalog Numbers: AC215700000, AC215700010, AC215700250, AC215702500

Synonyms: Aluminum Oxide; Morin Dyed; Alumina.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1344-28-1	Aluminum oxide	99	215-691-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause mechanical eye and skin irritation. May cause respiratory tract irritation. May cause lung damage.

Target Organs: Lungs.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Low hazard for usual industrial handling.
Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.
Inhalation: May cause respiratory tract irritation. May cause lung damage.
Chronic: Chronic inhalation of fine dusts may cause lung damage.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.
Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Do not ingest or inhale.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum oxide	10 mg/m ³ TWA (particulate matter containing no asbestos and <1% crystalline silica)	none listed	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Aluminum oxide: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: Odorless.
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 2980 deg C
Freezing/Melting Point:2000 deg C
Decomposition Temperature:Not available.
Solubility: Negligible in water.
Specific Gravity/Density:4.0 (water=1)
Molecular Formula:Al₂O₃
Molecular Weight:101.9612

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Incompatible materials.
Incompatibilities with Other Materials: Reacts with chlorine trifluoride or ethylene oxide. Exothermic reaction above 200C with halocarbon vapors produces toxic hydrogen chloride and phosgene.
Hazardous Decomposition Products: Hydrogen chloride, phosgene, none.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 1344-28-1: BD1200000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 1344-28-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1344-28-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Aluminum oxide (CAS# 1344-28-1, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1344-28-1 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1344-28-1: 0

Canada - DSL/NDSL

CAS# 1344-28-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1344-28-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Aluminum sulfate

ACC# 00980

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum sulfate

Catalog Numbers: AC192430000, AC192430050

Synonyms: Aluminum trisulfate; Dialuminum sulphate; Sulfuric acid aluminum salt

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-01-3	Aluminum sulfate	99	233-135-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum sulfate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported
pH: >2.9 at 5% solution.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 770 deg C
Decomposition Temperature: 770 deg C
Solubility: Soluble.
Specific Gravity/Density: 2.7 (water=1)
Molecular Formula: Al₂(SO₄)₃
Molecular Weight: 342.1358

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Dust generation, exposure to moist air or water.
Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants..
Hazardous Decomposition Products: Oxides of sulfur, aluminum oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10043-01-3: BD1700000
LD50/LC50:
CAS# 10043-01-3:
Draize test, rabbit, eye: 10 mg/24H Severe;
Oral, mouse: LD50 = 6207 mg/kg;

Carcinogenicity:
CAS# 10043-01-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-01-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10043-01-3: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10043-01-3: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.**Clean Air Act:**

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10043-01-3 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-01-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Aluminum, soluble salts), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 10043-01-3: 1

Canada - DSL/NDSL

CAS# 10043-01-3 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10043-01-3 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

PLATT BROTHERS AND COMPANY -- ZINC/ALUMINUM BASE ALLOYS IN WIRE, RODS, BARS, STRIPS, COILS
-- 8010-01-439-7910

=====
Product Identification
=====

Product ID:ZINC/ALUMINUM BASE ALLOYS IN WIRE, RODS, BARS, STRIPS, COILS
MSDS Date:09/15/1988
FSC:8010
NIIN:01-439-7910
Status Code:A
MSDS Number: CKKGX
=== Responsible Party ===
Company Name:PLATT BROTHERS AND COMPANY
Address:2670 S MAIN STREET
City:WATERBURY
State:CT
ZIP:06721
Country:US
Info Phone Num:203-753-4194
Emergency Phone Num:0000000000
CAGE:77315
=== Contractor Identification ===
Company Name:PLATT BROTHERS AND COMPANY
Address:2670 S MAIN STREET
Box:City:WATERBURY
State:CT
ZIP:06721
Country:US
Phone:203-753-4194
CAGE:77315

=====
Composition/Information on Ingredients
=====

Ingred Name:ZINC
CAS:1314-13-2
RTECS #:ZH4810000
Fraction by Wt: 80-99%
ACGIH TLV:1.0 AS FUME MG/M3

Ingred Name:ALUMINUM
CAS:7429-90-5
RTECS #:BD0330000
Fraction by Wt: 0-16.5%
ACGIH TLV:10 MG/M3

Ingred Name:CADMIUM
CAS:7440-43-9
RTECS #:EU9800000
Fraction by Wt: 0-0.005%
ACGIH TLV:10MG/M3
EPA Rpt Qty:10 LBS
DOT Rpt Qty:10 LBS

Ingred Name:COPPER
CAS:7440-50-8
RTECS #:GL5325000

Fraction by Wt: --0.75%
ACGIH TLV:0.2 AS FUME
EPA Rpt Qty:5000 LBS
DOT Rpt Qty:5000 LBS

Ingred Name:IRON
CAS:7439-89-6
RTECS #:NO4565500
Fraction by Wt: 0-0.75%
ACGIH TLV:5.0 AS FUME

Ingred Name:LEAD
CAS:7439-92-1
RTECS #:OF7525000
Fraction by Wt: 0-0.07%
ACGIH TLV:0.05 AS DUST OR FUME
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

Ingred Name:TITANIUM
CAS:7440-32-6
RTECS #:XR1700000
Fraction by Wt: 0-0.002%
ACGIH TLV:10.0 AS DIOXIDE

=====
===== Hazards Identification =====
=====

Health Hazards Acute and Chronic:ACUTE EXPOSURE TO ZINC/ALUMINUM DUST OR FUME MAY CAUSE IRRITATION TO THE EYES, NOSE OR THROAT; LEAVE A METALLIC TASTE IN THE MOUTH; RESULT IN METAL FUME FEVER; OR PRODUCE FLU-LIKE SYMPTOMS. UNDER NOR MAL HANDLING CONDITIONS THE SOLID ALLOY PRESENTS NO SIGNIFICANT HEALTH HAZARDS. PROCESSING OF THE ALLOY BY DUST OR FUME PRODUCING OPERATIONS (GRINDING, BUFFING, SAWING, FORGING, CUTTING, WELDING, ET C.) MAY RESULT IN THE POTENTIAL FOR EXPOSURE TO AIRBORN METAL PARTICULATES OR FUME. THE EXPOSURE LEVELS IN SECTION 1 ARE RELEVANT TO FUMES AND DUSTS. CHRONIC OVEREXPOSURE TO: ALUMINUM: MAY INITI ATE FIBROTIC CHANGES TO LUNG TISSUE. *

Effects of Overexposure:*CADMIUM: LOSS OF SMELL, ULCERATION OF THE NOSE, SHORTNESS OF BREATH, (EMPHYSEMA) KIDNEY DAMAGE, AND MILD ANEMIA, ALSO REPORTED TO CAUSE AN INCREASED INCIDENCE OF CANCER OF THE PROSTATE IN MEN. CO PPER: NO CHRONIC DEBILITATING SYMPTOMS INDICATED. IRON: SIDEROSIS LEAD: ANEMIA, URINARY DYSFUNCTION,METALLIC TASTE IN MOUTH, WEAKNESS, CONSTIPATION, NAUSEA, NERVOUS DISORDER. ZINC: CHROMOSOMAL A NOMALIES IN LEUKOCYTES REPORTED. ARTHRITIC, LAMENESS AND INFLAMMATION OF THE GASTROINTESTINAL TRACT REPORTED FROM ANIMAL STUDIES. TITANIUM: NO CHRONIC DEBILITATING SYMPTOMS INDICATED.

=====
===== First Aid Measures =====
=====

First Aid:INGESTION: INGESTION OF SIGNIFICANT AMOUNTS OF ZINC/ALUMINUM ALLOY ARE UNLIKELY. SEEK MEDICAL HELP IF LARGE QUANTITIES OF PRODUCT ARE INGESTED. INHALATION:REMOVE FORM EXPOSURE TO DUST OR FUME IF PRESENT. SEEK MEDICAL HELP IF REQUIRED. SKIN CONTACT: FLUSH THOROUGHLY WITH WATER. EYE CONTACT: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL HELP IF REQUIRED.

=====
===== Fire Fighting Measures =====

Fire Fighting Procedures: NEVER USE WATER AS AN EXTINGUISHING AGENT AROUND MOLTEN METAL. WATER WILL REACT VIOLENTLY WITH ANY MOLTEN METAL. ****

Unusual Fire/Explosion Hazard: **** USE SELF-CONTAINED BREATHING APPARATUS FOR PROTECTION AGAINST DEGRADATION PRODUCTS AND FIRE FIGHTING TECHNIQUES OR AGENTS APPLICABLE TO SURROUNDING MATERIALS. SMALL CHIPS, FINE TURNINGS AND DUST MAY IGI TE READILY. DO NOT USE HALOGENATED EXTINGUISHING AGENTS ON SMALL CHIPS OR FINES. DUST CLOUDS MAY BE EXPLOSIVE. *****

=====
===== Handling and Storage =====

Handling and Storage Precautions: TYPICALLY NO SPECIAL PROTECTION IS REQUIRED DURING USE OF THE PRODUCT BEYOND THAT REQUIRED FOR THE PROCESS OPERATION BEING EMPLOYED. WHERE DUST OR FUME LEVELS ARE GREATER THAN THOSE SPECIFIED IN SECTION ONE, NIOSH APPROVED RESPIRATORY PROTECTION SHOULD BE USED. **

Other Precautions: ** USE LOCAL EXHAUST VENTILATION FOR DUST/FUME. USE APPROVED GOGGLES FOR EYE PROTECTION. ***

=====
===== Exposure Controls/Personal Protection =====

Supplemental Safety and Health

*** WET MATERIAL SHOULD NEVER BE CHARGED INTO A MOLTEN BATH. EYE PROTECTION SHOULD BE USED WHEN CUTTING, GRINDING, MACHINING OR BUFFING PRODUCT. EYE PROTECTION SHOULD ALSO BE USED WITH ANY OTHER PROCESS THAT GENERATES DUST, FUMES OR CHIPS. WASH HANDS THOROUGHLY AFTER USE, ESPECIALLY BEFORE EATING.

=====
===== Physical/Chemical Properties =====

Melt/Freeze Pt: >376.7C, 710.F
M.P/F.P Text: 710-1200F
Spec Gravity: (H2O=1) 2.5-8.5

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
STRONG ACIDS, STRONG OXIDIZERS, STRONG ALKALIS (ESPECIALLY NAOH, KOH), FINELY DIVIDED METALS (ESPECIALLY ZINC, BARIUM, LITHIUM). SLOWLY CORRODES ALUMINUM, IRON, ZINC.

Stability Condition to Avoid: STABLE UNDER ORDINARY CONDITIONS OF USE OR STORAGE. SLOWLY DECOMPOSED BY LIGHT. DETERIORATES RAPIDLY IN WARM, MOIST CLIMATES.

Hazardous Decomposition Products: CARBON DIOXIDE & CARBON MONOXIDE MAY FORM WHEN HEATED TO DECOMPOSITION. HYDROGEN CHLORIDE GAS & PHOSGENE GAS MAY BE FORMED UPON HEATING. DECOMPOSES WITH MOISTURE TO YIELD TRICHLOROACETIC ACID & HCL

=====
===== Toxicological Information =====

Toxicological Information: ***** THE ALLOY IS STABLE, NON-HAZARDOUS SOLID AT ROOM TEMPERATURE. MATERIAL MAY REACT WITH STRONG ACIDS OR ALKALINE MATERIALS. MATERIAL DOES NOT PRESENT A SIGNIFICANT HEALTH

HAZARD UNDER NORMAL HAND LING AND STORAGE.

=====
===== Ecological Information =====

Ecological:WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO QUICKLY EVAPORATE. WHEN RELEASED INTO THE SOIL, THIS MATERIAL MAY LEACH INTO GROUNDWATER. WHEN RELEASED INTO THE SOIL, THIS MATERIAL MAY BIODE GRADE TO A MODERATE EXTENT. WHEN RELEASED TO WATER, THIS MATERIAL IS EXPECTED TO QUICKLY EVAPORATE. WHEN RELEASED INTO WATER, THIS MATERIAL IS NOT EXPECTED TO BIODEGRADE. THIS MATERIAL IS NOT EXPECTED TO SIGNIFIGANTLY BIOACCUMULATE. WHEN RELEASED TO THE AIR, THIS MATERIAL MAY BE MODERATELY DEGRADED BY REACTION WITH PHOTOCHEMICALLY PRODUCED HYDROXYL RADICALS. LC50/96-HR VALUES FOR FISH ARE BETWEEN 100-100 MG/L.

=====
===== MSDS Transport Information =====

Transport Information:AIR (ICAO) SHIPPING INFORMATION: SHIPPING NAME: TETRACHLOROETHYLENE, HAZARD CLASS: 6.1, UN NUMBER: UN1897, PACKING GROUP: III. DOT TRANSPORTATION INFORMATION: TETRACHLOROETHYLENE, HAZARD CLASS: 6.1, U N NUMBER: UN1897, PACKING GROUP: III.

=====
===== Regulatory Information =====

SARA Title III Information:TETRACHLOROETHYLENE IS A SARA 313 LISTED CHEMICAL
Federal Regulatory Information:CERCLA RQ: 100 LB, RCRA CODE: U210.
State Regulatory Information:PRODUCT CONTAINS CHEMICALS KNOWN TO STATE OF CALIFORNIA TO CAUSE CANCER.

=====
===== Other Information =====

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Material Safety Data Sheet

Amberlite XAD-4 Resin

ACC# 91919

Section 1 - Chemical Product and Company Identification

MSDS Name: Amberlite XAD-4 Resin

Catalog Numbers: AC202230000, AC202231000, AC202235000, AC9596581, NC9105118, XXAC20223-25KG, XXAC2022322K

Synonyms: None Known.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	51-55	231-791-2
9003-69-4	Divinylbenzene polymer	45-49	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: 427 deg C (800.60 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store at around 20°C. Store at around 20°C.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Divinylbenzene polymer	none listed	none listed	none listed

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical.

Divinylbenzene polymer: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Granules

Appearance: white

Odor: odorless

pH: 7-9

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: insoluble

Specific Gravity/Density:1.06

Molecular Formula:Mixture

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Strong oxidants, strong oxidants.

Incompatibilities with Other Materials: Avoid contact with strong oxidizing agents, particularly concentrated nitric acid..

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 9003-69-4 unlisted.

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 9003-69-4:

Toxicity data for a compositionally similar material: , Oral LD50-rat: >5000 mg/kg., Dermal LD50-rabbit: >5000 mg/kg.

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 9003-69-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 9003-69-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 9003-69-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice

immediately (show the label where possible).
S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 9003-69-4: No information available.

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 9003-69-4 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Amberlyst ® A-26 Ion-Exchange Resin

ACC# 17643

Section 1 - Chemical Product and Company Identification

MSDS Name: Amberlyst ® A-26 Ion-Exchange Resin

Catalog Numbers: AC202180000, AC202180010, AC202180050, AC202182500

Synonyms: Poly(caprolactone) Triol.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
39280-09-6	Poly(caprolactone) Triol	100.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless viscous liquid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Get medical aid. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use agent most appropriate to extinguish fire. Cool containers with flooding quantities of water until well after fire is out. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 226 deg C (438.80 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean

up spills immediately, observing precautions in the Protective Equipment section. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Poly(caprolactone) Triol	none listed	none listed	none listed

OSHA Vacated PELs: Poly(caprolactone) Triol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Viscous liquid
Appearance: clear, colorless
Odor: None reported.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: > 210 deg C
Freezing/Melting Point:-26 deg C
Decomposition Temperature:Not available.
Solubility: Not available.
Specific Gravity/Density:1.0700g/cm3
Molecular Formula:Not available.
Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 39280-09-6 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 39280-09-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 39280-09-6 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 39280-09-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

. WGK (Water Danger/Protection)

CAS# 39280-09-6: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Acid Black 1

ACC# 60360

Section 1 - Chemical Product and Company Identification

MSDS Name: Acid Black 1

Catalog Numbers: AC187300000, AC187300250, AC187301000, BP124-10

Synonyms: Amido Black 10B; Amido Schwarz; Aniline Blue Black; C.I. 20470; Naphthalene Black 10B; Naphthol Blue Black;

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1064-48-8	Acid Black 1	96-100	213-903-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dangerous fire hazard in the form of dust when exposed to heat or flame.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation.

Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acid Black 1	none listed	none listed	none listed

OSHA Vacated PELs: Acid Black 1: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark brown - reddish - black

Odor: none reported

pH: 9.0 (1% aq. sol (25°C))

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: 195 deg C

Solubility: 10 g/l (25°C)

Specific Gravity/Density: Not available.

Molecular Formula: C₂₂H₁₄N₆O₉S₂Na₂

Molecular Weight: 616.48

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, heating to decomposition.

Incompatibilities with Other Materials: Strong oxidizing agents, reducing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide, sodium monoxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 1064-48-8: QJ6196000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1064-48-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found
Mutation in Microorganisms: Salmonella typhimurium = 50 ug/plate.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	FLAMMABLE SOLIDS, ORGANIC, N.O.S.	Not Regulated.
Hazard Class:	4.1	
UN Number:	UN1325	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1064-48-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1064-48-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 1064-48-8: 1

Canada - DSL/NDSL

CAS# 1064-48-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ammonium Persulfate, 98%

ACC# 95884

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Persulfate, 98%

Catalog Numbers: AC201530000, AC201530010

Synonyms: Ammonium Persulfate; Peroxydisulfuric Acid Diammonium Salt.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7727-54-0	Ammonium persulfate	98.0	231-786-5

Hazard Symbols: XN O

Risk Phrases: 20/22 8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. **Danger!** Strong oxidizer. Contact with other material may cause a fire. May cause allergic skin reaction. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. May be harmful if swallowed. Moisture sensitive.

Target Organs: None.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema.

Chronic: Repeated or prolonged exposure may cause allergic reactions in sensitive individuals.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Oxidizer. Greatly increases the burning rate of combustible materials. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Do NOT get water inside containers. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires, flood fire area with water from a distance.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up,

then place into a suitable container for disposal. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Do not allow contact with water. Wash clothing before reuse. Keep from contact with moist air and steam.

Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from metals. Keep away from reducing agents. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium persulfate	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium persulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Decomposes.
Freezing/Melting Point: 120 deg C
Decomposition Temperature: > 120 deg C
Solubility: 80g/100ml(25 C) (may decompose)
Specific Gravity/Density: 1.982 (water=1)
Molecular Formula: (NH₄)₂S₂O₈
Molecular Weight: 228.1846

Section 10 - Stability and Reactivity

Chemical Stability: Substance is shock sensitive and thermally unstable. Decomposes when heated. May decompose on exposure to moist air or water.

Conditions to Avoid: High temperatures, incompatible materials, ignition sources, moisture, metals, combustible materials, organic materials, reducing agents.

Incompatibilities with Other Materials: Moisture.

Hazardous Decomposition Products: Nitrogen oxides, oxides of sulfur, ammonia and/or derivatives, nitrogen.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7727-54-0: SE0350000

LD50/LC50:

CAS# 7727-54-0:

Oral, rat: LD50 = 689 mg/kg; <BR.

Carcinogenicity:

CAS# 7727-54-0: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	AMMONIUM PERSULFATE				No information available.
Hazard Class:	5.1				
UN Number:	UN1444				
Packing Group:	III				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7727-54-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7727-54-0: acute, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7727-54-0 can be found on the following state right to know lists: New Jersey.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7727-54-0: 1

Canada - DSL/NDSL

CAS# 7727-54-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

Canadian Ingredient Disclosure List

Exposure Limits

CAS# 7727-54-0: OEL-DENMARK: TWA 2 mg/m³ OEL-UNITED KINGDOM: TWA 1 mg

Material Safety Data Sheet

Ammonium Bromide

ACC# 01140

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Bromide

Catalog Numbers: A650-500, S79895

Synonyms: Hydrobromic Acid Monoammoniate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12124-97-9	Ammonium Bromide	100	235-183-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye irritation. May cause respiratory and digestive tract irritation. May cause skin irritation. Air sensitive. Hygroscopic (absorbs moisture from the air).

Target Organs: No data found.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation. Inhalation of bromides may cause irritation of the upper respiratory tract and lung tissue.

Chronic: Chronic ingestion may cause bromism characterized by disturbances of the central nervous system, skin and digestive tract.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation. Handle under an inert atmosphere. Store protected from air.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from moisture. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium Bromide	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium Bromide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Slightly acidic.

Vapor Pressure: 1 mm Hg @ 198C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 846 deg F

Decomposition Temperature:Not available.

Solubility: 97% in water.

Specific Gravity/Density:2.4

Molecular Formula:NH₄Br

Molecular Weight:97.9387

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation, moisture, exposure to air, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Air, moisture, strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, hydrogen bromide, ammonia and/or derivatives.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 12124-97-9: B09155000

LD50/LC50:

CAS# 12124-97-9:

Oral, mouse: LD50 = 2860 mg/kg;

Oral, rat: LD50 = 2700 mg/kg;

Oral, rat: LD50 =

Carcinogenicity:

CAS# 12124-97-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12124-97-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 12124-97-9: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12124-97-9 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 12124-97-9: No information available.

Canada - DSL/NDSL

CAS# 12124-97-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ammonium dichromate

ACC# 01210

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium dichromate

Catalog Numbers: AC208810000, AC208811000, AC208815000, A644-100, A644-12, A644-212, A644-50, A644-500, S70636-1

Synonyms: Ammonium bichromate; Ammonium dichromate(VI).

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7789-09-5	Ammonium dichromate	99	232-143-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange to red crystals.

Danger! Risk of explosion by shock, friction, fire or other sources of ignition. Danger of serious damage to health by prolonged exposure through inhalation. May be fatal if inhaled or swallowed. Strong oxidizer. Contact with other material may cause a fire. Causes burns by all exposure routes. Harmful if absorbed through the skin. May cause allergic respiratory and skin reaction. May impair fertility. May cause harm to the unborn child. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause heritable genetic damage. May cause sensitization by inhalation and by skin contact.

Target Organs: Kidneys, liver, lungs, respiratory system, gastrointestinal system, eyes, reproductive system, skin.

Potential Health Effects

Eye: Causes eye burns. May cause blindness. May cause redness, pain, blurred vision and possible eye damage.

Skin: Harmful if absorbed through the skin. Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause deep, penetrating ulcers of the skin. May cause dermatitis. 4-hour exposure to solid material showed no corrosion but well-defined erythema in 2/6 animals. Solid material moistened with physiological saline produced well-defined erythema and edema in all 6 animals, 2 of which showed necrotic focal sites. (Bayer)

Ingestion: May be fatal if swallowed. Poison by ingestion. Causes gastrointestinal tract burns. May cause circulatory system failure.

Inhalation: May be fatal if inhaled. May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Causes chemical burns to the respiratory tract.

Chronic: Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis. Prolonged or repeated eye contact may cause conjunctivitis. Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause liver and kidney damage. May cause cancer in humans. Possible risk of harm to the unborn child. May impair fertility.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Call a poison control center.

Inhalation: If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Persons with asthma, allergies, and known sensitization to chromic acid or chromates may be at increased risk from exposure to this product. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. This material is an explosion hazard when exposed to heat,

mechanical shock, or friction. Explosive decomposition may occur under fire conditions.

Extinguishing Media: Use water only! Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. Do NOT use dry chemicals, CO₂, Halon or foams.

Flash Point: Not available.

Autoignition Temperature: 218 deg C (424.40 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 2; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Carefully scoop up and place into appropriate disposal container. Isolate area and deny entry. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Use only in a well-ventilated area. Minimize dust generation and accumulation. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Use only in a chemical fume hood. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Keep away from heat, sparks and flame.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Heat can cause thermal decomposition and pressure build-up inside containers. Material can explode if dry.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium dichromate	0.05 mg/m ³ TWA (as Cr) (listed under Chromium (VI) compounds- water soluble).	0.001 mg/m ³ TWA (as Cr) (listed under Chromates). 15 mg/m ³ IDLH (as Cr(VI)) (listed under Chromates).	5 æg/m ³ TWA (listed under Chromium (VI) compounds). 0.1 mg/m ³ Ceiling (as CrO ₃ , applies to any operations or sectors for which the H exavalent Chromium standard [29 CFR 1910.1026] is stayed or is otherwise not in effect) (listed under Chromates). 2.5 æg/m ³ Action Level (as Cr.); 5 æg/m ³ TWA (as Cr, Cancer hazard - See 29 CFR 1910.1026) (listed under Chromium (VI) compounds).

OSHA Vacated PELs: Ammonium dichromate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: orange to red

Odor: odorless

pH: 3.45 for 10% soln.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 170 deg C

Decomposition Temperature: 170 deg C

Solubility: 360 g/l (20°C)

Specific Gravity/Density: 2.1500

Molecular Formula: (NH₄)₂Cr₂O₇

Molecular Weight: 252.06

Section 10 - Stability and Reactivity

Chemical Stability: Heating may cause an explosion.

Conditions to Avoid: Ignition sources, dust generation, excess heat, combustible materials, mechanical shock, friction.

Incompatibilities with Other Materials: Reducing agents, acids, bases, alcohols, hydrazine, sodium nitrate, ethylene glycol, carbides.

Hazardous Decomposition Products: Oxides of nitrogen, nitrogen gas, toxic chromium oxide fumes.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7789-09-5: HX7650000; HX7660000

LD50/LC50:

Not available.

Oral, rat: LD50 = 67.5 mg/kg; Inhalation, rat: LC50 = 0.156 mg/l/4H; Dermal, rabbit: LD50 = 1640 mg/kg (reported by Bayer)

Carcinogenicity:

CAS# 7789-09-5:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Chromium (VI) compounds-water soluble').
- **California:** carcinogen, initial date 2/27/87 (listed as Chromium (VI) compounds).
- **NTP:** Known carcinogen (listed as Chromium (VI) compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Hexavalent chromium compounds have been said to also cause kidney damage in workers where absorption through damaged skin has occurred.

Teratogenicity: See actual entry in RTECS for complete information.

Reproductive Effects: May impair fertility.

Mutagenicity: DNA Repair: Salmonella typhimurium = 50 mmol/L.; DNA Repair: Bacillus subtilis = 50 mmol/L.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Mosquito Fish: LC50 = 136 mg/L; 96 Hr; Unspecified Fish: Mosquito Fish: LC50 = 212 mg/L; 48 Hr; Unspecified Chromium in soil can be transported to the atmosphere by way of aerosol formation. Chromium is also transported from soil through runoff and leaching of water. Runoff could remove both chromium ions and bulk precipitates of chromium, with final deposition on either a different land area or a water body. Chromium is present usually as Cr(III) in the soil and is characterized by its lack of mobility, except in cases where Cr(VI) is involved. Chromium(VI) of natural origin is rarely found.

Environmental: Most of the chromium in surface waters may be present in particulate form as sediment. Some of the particulate chromium would remain as suspended matter and ultimately be deposited in sediments. Trout can accumulate hexavalent chromium even at levels of 0.001 ppm. Barley absorbs chromium. Concentration factors for chromium: Marine plants 2000 times; freshwater and brown algae concentrate 100-500 times; Marine invertebrates 2000 times; Marine fish 400 times; and Freshwater fish 200 times.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	AMMONIUM DICHROMATE	AMMONIUM DICHROMATE
Hazard Class:	5.1	5.1
UN Number:	UN1439	UN1439
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7789-09-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7789-09-5: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7789-09-5: immediate, delayed, fire.

Section 313

This material contains Ammonium dichromate (listed as Chromium (VI) compounds), 99%, (CAS# 7789-09-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7789-09-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7789-09-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Chromium (VI) compounds- water soluble), Minnesota, (listed as Chromium (VI) compounds), Massachusetts.

California Prop 65**The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:**

WARNING: This product contains Ammonium dichromate, listed as 'Chromium (VI) compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T+ N E

Risk Phrases:

R 2 Risk of explosion by shock, friction, fire or other sources of ignition.

R 21 Harmful in contact with skin.

R 25 Toxic if swallowed.

R 26 Very toxic by inhalation.

R 34 Causes burns.

R 42/43 May cause sensitization by inhalation and skin contact.

R 45 May cause cancer.
R 46 May cause heritable genetic damage.
R 8 Contact with combustible material may cause fire.
R 48/23 Toxic : danger of serious damage to health by prolonged exposure through inhalation.
R 60 May impair fertility.
R 61 May cause harm to the unborn child.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardous waste.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7789-09-5: 3

Canada - DSL/NDSL

CAS# 7789-09-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, F, D1A, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7789-09-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium Iodide, P.A.

ACC# 26312

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Iodide, P.A.

Catalog Numbers: AC206460000, AC206461000, AC206465000, A937

Synonyms: None known.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12027-06-4	Ammonium iodide ((nh4)i)	ca. 100	234-717-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light yellow crystals.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Air sensitive. Light sensitive. Hygroscopic (absorbs moisture from the air). May cause reproductive and fetal effects. The toxicological properties of this material have not been fully investigated.

Target Organs: Thyroid.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Chronic ingestion of iodides during pregnancy

has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms could include skin rash, running nose and headache.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 405 deg C (761.00 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective

Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light. Handle under an inert atmosphere. Store protected from air.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from moisture. Store protected from light. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium iodide (nh ₄)i	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium iodide ((nh₄)i): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: white to light yellow
Odor: None reported.
pH: 4.5-6.5, 5% aq. soln
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:551 deg C
Decomposition Temperature:405 deg C
Solubility: 1g/0.6ml
Specific Gravity/Density:2.5140g/cm3
Molecular Formula:H4IN
Molecular Weight:144.94

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, dust generation, exposure to air, excess heat, strong oxidants, exposure to moist air or water.
Incompatibilities with Other Materials: Air, moisture, strong oxidizing agents.
Hazardous Decomposition Products: Oxides of nitrogen, irritating and toxic fumes and gases, hydrogen iodide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 12027-06-4 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 12027-06-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12027-06-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 12027-06-4: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12027-06-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 12027-06-4: 1

Canada - DSL/NDSL

CAS# 12027-06-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 12027-06-4 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium molybdate(VI) tetrahydrate

ACC# 01284

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium molybdate(VI) tetrahydrate

Catalog Numbers: AC205850000, AC205851000, AC205855000, AC423310000, AC423310025, AC423310050, AC423311000, 42331-5000, A674-10, A674-3, A674-500, NC9419177, NC9709865

Synonyms: Ammonium heptamolybdate tetrahydrate; Ammonium heptamolybdate tetrahydrate; Ammonium paramolybdate tetrahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12054-85-2	Ammonium molybdate(VI) tetrahydrate	99+	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if swallowed. May cause blood abnormalities. May cause liver and kidney damage.

Target Organs: Blood, kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause liver

and kidney damage. Molybdenum toxicity in ruminants is characterized by symptoms of copper deficiency.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled. Exposure may cause blood abnormalities. In an inhalation study, rats were administered 60 ug ammonium molybdate/ m3, 24 hours a day for 17 weeks. Changes in erythrocyte and leukocyte cell counts were observed.

Chronic: No information found. Rats were fed 25 or 50 ppm of ammonium molybdate in their food for 100 days, at which time they were killed and examined. Ammonium molybdate at 25 ppm had no effect on growth; at 50 ppm a slight decrease in the growth rate was observed. No deaths or significant effects on hemoglobin levels were observed at 25 or 50

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium molybdate(VI) tetrahydrate	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).
Ammonium molybdate(VI) anhydrous	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).

OSHA Vacated PELs: Ammonium molybdate(VI) tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Ammonium molybdate(VI) anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder
Appearance: white
Odor: none reported
pH: 5.0 - 5.5 (5% aq.sol.)
Vapor Pressure: Not applicable.
Vapor Density: Not available.
Evaporation Rate:Not applicable.
Viscosity: Not applicable.
Boiling Point: decomposes
Freezing/Melting Point:190 deg C
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:2.490
Molecular Formula:H₂₄Mo₇N₆O₂₄.4H₂O
Molecular Weight:1235.86

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong acids, strong oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, ammonia and/or derivatives, oxides of molybdenum.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 12054-85-2 unlisted.

CAS# 12027-67-7: QA5076000

LD50/LC50:

Not available.

Not available.

Oral median lethal dose for daily repeated doses was found to be 333 mg Mo/kg/day (up to 232 days) for ammonium molybdate. This is not an acute oral LD50 value, which is a dose administered once.

Carcinogenicity:

CAS# 12054-85-2:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.

- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 12027-67-7:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		

Packing Group:		
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Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12054-85-2 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 12027-67-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 12054-85-2: immediate, delayed.

CAS # 12027-67-7: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12054-85-2 can be found on the following state right to know lists: California, (listed as Molybdenum compounds, n.o.s.), Minnesota, (listed as Molybdenum soluble compounds).

CAS# 12027-67-7 can be found on the following state right to know lists: Minnesota, (listed as Molybdenum soluble compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 12054-85-2: 1

CAS# 12027-67-7: 1

Canada - DSL/NDSL

CAS# 12027-67-7 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 12054-85-2 (listed as Molybdenum compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 12027-67-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium nitrate

ACC# 01290

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium nitrate

Catalog Numbers: AC205860000, AC205860010, AC205861000, AC205865000, AC423350000, AC423350010, AC423350250, A676-212, A676-500, S75244

Synonyms: Nitric acid, ammonium salt; Norway saltpeter.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6484-52-2	Ammonium nitrate	> 98	229-347-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to gray to brown solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. May cause methemoglobinemia. Hygroscopic (absorbs moisture from the air). Ammonium nitrate when contaminated with oil, charcoal, or other organic materials should be considered an explosive capable of detonation by combustion or by explosion of adjacent explosive materials.

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.

Inhalation: Causes respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown blood. Inhalation can cause systemic acidosis and methemoglobinemia.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. May cause digestive tract disturbances.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Absorption of this product into the body may cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). Moderate degrees of cyanosis need to be treated only by supportive measures: bed rest and oxygen inhalation. For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood. Cleansing of the entire contaminated area of the body is of utmost importance.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. May explode under confinement and high temperatures, especially if contaminated.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use flooding quantities of water as spray.

Flash Point: Not available.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 2; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep away from heat, sparks and flame. Keep from contact with clothing and other combustible materials. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Avoid breathing dust. Inform laundry personnel of contaminant's hazards. Avoid localized heating of ammonium nitrate, potentially leading to development of high temperature areas. Ensure that ammonium nitrate is not exposed to strong shock waves from explosives. Avoid low pH (acidic) conditions.

Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids. Keep away from reducing agents. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: solid

Appearance: white to gray to brown

Odor: odorless

pH: 5.4 (0.1 M solution)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 169 deg C

Decomposition Temperature: 210 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.725 @ 25°C

Molecular Formula: NH₄NO₃

Molecular Weight: 80.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Risk of explosion if heated under confinement. Deliquescent (tending to absorb atmospheric water vapor and become liquid).

Conditions to Avoid: Dust generation, contamination, heating in a confined space.

Incompatibilities with Other Materials: Strong reducing agents, strong acids, finely powdered metals, organic matter, chlorides, combustible materials.

Hazardous Decomposition Products: Oxides of nitrogen.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6484-52-2: BR9050000

LD50/LC50:

CAS# 6484-52-2:

Oral, rat: LD50 = 2217 mg/kg;

Carcinogenicity:

CAS# 6484-52-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	AMMONIUM NITRATE	AMMONIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1942	UN1942
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6484-52-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 6484-52-2: immediate, fire, reactive.

Section 313

This material contains Ammonium nitrate (listed as Water Dissociable Nitrate Compounds), > 98%, (CAS# 6484-52-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6484-52-2 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

R 9 Explosive when mixed with combustible material.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 6484-52-2: 1

Canada - DSL/NDSL

CAS# 6484-52-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 6484-52-2 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium oxalate monohydrate

ACC# 06510

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium oxalate monohydrate

Catalog Numbers: AC206270000, AC206270010, AC206275000, AC423360000, AC423360050, AC423365000, S75031, S75032, S79900, S799001, A679-500

Synonyms: Diammonium oxalate, monohydrate; Ethanedioic acid, diammonium salt monohydrate; Oxalic acid, diammonium salt monohydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6009-70-7	Ammonium oxalate monohydrate	> 99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause kidney damage.

Target Organs: Kidneys, heart, eyes, skin, brain, nerves, mucous membranes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Oxalate is an irritant and may cause dermatitis. Skin lesions begin with epithelial cracking and the formation of slow-healing ulcers. The fingers may appear cyanotic.

Ingestion: Ulcerations of the mouth, vomiting of blood, and rapid appearance of shock,

convulsions, twitching, tetany, and cardiovascular collapse may occur following ingestion of oxalic acid or its soluble salts. Systemic effects may be due to formation of calcium oxalate which is insoluble at physiological pH and can be deposited in the brain and kidney tubules. Resultant hypocalcemia might disturb the function of the heart and nerves. Mean lethal dose for oxalates in adults is estimated at 10 - 30 grams (143 - 428 mg/kg).

Inhalation: Inhalation of oxalic acid dust or vapor produces irritation of the respiratory tract, protein in the urine, nosebleed, ulceration of the mucous membranes, headache, nervousness, cough, vomiting, emaciation, back pain (due to kidney injury), and weakness.

Chronic: Inhalation of oxalic acid dust or mist over a long period of time might result in weight loss and respiratory tract inflammation. Rats administered oxalic acid at 2.5 and 5% in the diet for 70 days developed depressed thyroid function and weight loss. A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: Intravenous administration of calcium gluconate or calcium chloride may be required if hypocalcemia or hypocalcemic tetany occur.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Oxalates slowly corrode steel.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium oxalate monohydrate	none listed	none listed	none listed
Ammonium oxalate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium oxalate monohydrate: No OSHA Vacated PELs are listed for this chemical. Ammonium oxalate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 6.4 (0.1M soln)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not available.

Boiling Point: Decomposes.

Freezing/Melting Point:70 deg C

Decomposition Temperature:70 deg C

Solubility: Soluble.

Specific Gravity/Density:1.5

Molecular Formula:C₂H₈N₂O₄.H₂O

Molecular Weight:142.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat, Oxalates slowly corrode steel..

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, formic acid, ammonia.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6009-70-7 unlisted.

CAS# 1113-38-8: RO2750000

LD50/LC50:

Not available.

Not available.

CAS# 1113-38-8; Rat TDLo Oral: 9 mL/kg/3D continuous. Published data indicated liver changes and biochemical effects. Mean lethal dose for oxalates in adults is estimated at 10-30 grams (143-428 mg/kg).

Carcinogenicity:

CAS# 6009-70-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 1113-38-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Teratogenicity: No information available.

Reproductive Effects: Oxalic acid caused kidney damage in fetal sheep and rats and disturbed the estrus cycle in rats. Increased sperm abnormalities were seen in the second generation of mice administered 0.2% oxalic acid in the drinking water.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLID ORGANIC NOS (AMMONIUM OXALATE MONOHYDRATE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6009-70-7 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 1113-38-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 6009-70-7: 5000 lb final RQ (listed under Ammonium oxalate); 2270 kg final RQ (listed under

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 6009-70-7: immediate, delayed.

CAS # 1113-38-8: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 6009-70-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6009-70-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 1113-38-8 can be found on the following state right to know lists: New Jersey.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 6009-70-7: 1

CAS# 1113-38-8: No information available.

Canada - DSL/NDSL

CAS# 1113-38-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

**SIGMA CHEMICAL COMPANY -- 09910 AMMONIUM PERCHLORATE FINE CRYST --
6850-00F056548**

=====
===== Product Identification =====

Product ID:09910 AMMONIUM PERCHLORATE FINE CRYST
MSDS Date:08/01/1995
FSC:6850
NIIN:00F056548
MSDS Number: CHNDZ
=== Responsible Party ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178-5000
Country:US
Info Phone Num:314-771-5765/800-325-3010
Emergency Phone Num:314-771-5765/800-325-3010
CAGE:21076

==== Contractor Identification ====

Company Name:ALDRICH CHEMICAL CO INC
Address:1001 WEST ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:60928

Company Name:FLUKA CHEMICAL CORP
Address:1001 WEST ST PAUL
Box:City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:63181

Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
===== Composition/Information on Ingredients =====

Ingred Name:AMMONIUM PERCHLORATE
CAS:7790-98-9
RTECS #:SC7520000

=====
===== Hazards Identification =====

LD50 LC50 Mixture:ORAL LD50(RAT): 4200 MG/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:HARMFUL IF INGESTED, INHALED/ABSORBED
THROUGH SKIN. EYES/SKIN: IRRITATION. INHALATION: IRRITATING TO
MUCOUS MEMBRANES & UPPER RESPIRATORY TRACT.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION.

=====
===== First Aid Measures =====

First Aid:EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER FOR 15 MINS.
INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED.
INGESTION: WASH OUT MOUTH W/WATER IF CONSCIOUS. OBTAIN MEDICAL
ATTENTION IN ALL CAS ES.

=====
===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY.
Fire Fighting Procedures:WEAR SCBA & PROTECTIVE CLOTHING. USE WATER
SPRAY TO COOL FIRE-EXPOSED CONTAINERS.
Unusual Fire/Explosion Hazard:MAY EXPLODE WHEN HEATED. CONTACT W/OTHER
MATERIAL MAY CAUSE FIRE. EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR SCBA, RUBBER BOOTS & HEAVY
RUBBER GLOVES. COVER W/DRY LIME/SODA ASH, PICKUP, KEEP IN A CLOSED
CONTAINER & HOLD FOR WASTE DISPOSAL. VENTILATE AREA & WASH SITE
AFTER MATERIAL PICKUP IS COMPLETE.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL DRY PLACE. KEEP AWAY
FROM COMBUSTIBLE MATERIALS/HEAT/SPARKS & OPEN FLAME. KEEP TIGHTLY
CLOSED.
Other Precautions:AVOID PROLONGED/REPEATED EXPOSURE. DON'T GET IN EYES,
SKIN/CLOTHING. DON'T BREATHE DUST.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:CHEMICAL FUME HOOD.
Protective Gloves:CHEMICAL RESISTANT
Eye Protection:SAFETY GOGGLES
Other Protective Equipment:PROTECTIVE CLOTHING, SAFETY SHOWER & EYE
BATH.
Work Hygienic Practices:DISCARD CONTAMINATED CLOTHING & SHOES. WASH
THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

Spec Gravity:1.95
Appearance and Odor:WHITE POWDER

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
STRONG REDUCING AGENTS, STRONG ACIDS, STRONG OXIDIZERS.
Stability Condition to Avoid: HEAT, SPARKS, OPEN FLAMES.
Hazardous Decomposition Products: COMBUSTION: AMMONIA.

===== Disposal Considerations =====

Waste Disposal Methods: CAUTIOUSLY ADD A LARGE STIRRED EXCESS OF WATER.
ADJUST THE PH TO NEUTRAL, SEPARATE INSOLUBLE SOLIDS/LIQUIDS &
PACKAGE FOR HAZARDOUS WASTE DISPOSAL, IAW/FEDERAL, STATE & LOCAL
REGULATIONS. FLUSH THE AQUEOUS SOLUTION DOWN THE DRAIN W/PLENTRY OF
WATER.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Ammonium phosphate, dibasic

ACC# 01350

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium phosphate, dibasic

Catalog Numbers: AC201820000, AC201822500, AC201825000, AC423370000, AC423370050, 42337-5000, A686-500, A686500LC, BP361-500

Synonyms: Diammonium hydrogen phosphate; DAP.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7783-28-0	Ammonium phosphate, dibasic	99+	231-987-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium phosphate, dibasic	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium phosphate, dibasic: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Not available.

pH: 7.9 - 8.3 (5% aq.sol. 20°C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: 100 deg C

Solubility: 58 g/100mL (20°C)

Specific Gravity/Density: 1.619

Molecular Formula: (NH₄)₂HPO₄

Molecular Weight: 132.06

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive.

Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, sodium hypochlorite.

Hazardous Decomposition Products: Nitrogen oxides, oxides of phosphorus, ammonia.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7783-28-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7783-28-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7783-28-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7783-28-0: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7783-28-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7783-28-0: 1

Canada - DSL/NDSL

CAS# 7783-28-0 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7783-28-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ammonium sulfate

ACC# 01410

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium sulfate

Catalog Numbers: AC205870000, AC205870010, AC205872500, AC423400000, AC423400030, AC423400050, AC423400250, 42340-0010, 42340-5000, A701-3, A701-50, A702-10, A702-3, A702-500, A938-500, BP212-212, BP212R-1, NC9155259, NC9179991, NC9273346, NC9685224, S71915ACS

Synonyms: Diammonium sulfate; Sulfuric acid, diammonium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7783-20-2	Ammonium sulfate	99+	231-984-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless crystals.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Causes redness and pain.

Skin: Causes skin irritation. May be harmful if absorbed through the skin. May cause reddening of the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be

harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled. May cause respiratory difficulty and coughing. May contribute to asthma attacks or clearance problems in persons with these pre-existing pulmonary diseases

Chronic: Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated exposure may cause permanent eye damage. Chronic exposure may cause lung damage. Systemic ammonia poisoning is possible if sufficient absorption occurs.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: colorless

Odor: odorless

pH: 5-6 (5% aq.sol. @ 20°C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point:280 deg C
Decomposition Temperature:Not available.
Solubility: 77g/100mL @ 25°C
Specific Gravity/Density:1.760
Molecular Formula:(NH₄)₂SO₄
Molecular Weight:132.13

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, heating to decomposition.
Incompatibilities with Other Materials: Chlorates, nitrites, oxidizing agents, bases, alkali metals.
Hazardous Decomposition Products: Oxides of sulfur, nitrogen oxides (NO_x) and ammonia (NH₃).
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7783-20-2: BS4500000
LD50/LC50:
CAS# 7783-20-2:
Oral, mouse: LD50 = 640 mg/kg;
Oral, mouse: LD50 = 4280 mg/kg;
Oral, rat: LD50 = 2840 mg/kg;
Oral, rat: LD50 = 4540 mg/kg;

Carcinogenicity:
CAS# 7783-20-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Water flea Daphnia: LC50 = 423 mg/L; 25 Hr; Unspecified No data available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7783-20-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7783-20-2: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7783-20-2 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7783-20-2: 1

Canada - DSL/NDSL

CAS# 7783-20-2 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7783-20-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Aniline Blue

ACC# 60030

Section 1 - Chemical Product and Company Identification

MSDS Name: Aniline Blue

Catalog Numbers: AC229660000, AC229660250, AC229661000, AC401180000, 40118-0250, A967-25

Synonyms: Acid Blue B; Calcocid Blue B; Marine Blue V; China Blue; C.I. 42755; C.I. Acid Blue 22; Ink Blue A; Soluble Blue B; Benzenesulfonic acid,

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
28631-66-5	Aniline blue	100	249-113-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark purple solid.

Warning! Causes eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: Causes skin irritation. May be absorbed through the skin in harmful amounts.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aniline blue	none listed	none listed	none listed

OSHA Vacated PELs: Aniline blue: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark purple

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.
Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:Not available.
Molecular Formula:C32H25N3O9S3Na2
Molecular Weight:737.76

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation.
Incompatibilities with Other Materials: Not available.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 28631-66-5: DB4958000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 28631-66-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 28631-66-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 28631-66-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 28631-66-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 28631-66-5: No information available.

Canada - DSL/NDSL

CAS# 28631-66-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

POST APPLE SCIENTIFIC INC -- CHARCOAL ANIMAL POWDER,89440,GPL 495 C 99 --
6810-00D007574

=====
Product Identification
=====

Product ID:CHARCOAL ANIMAL POWDER,89440,GPL 495 C 99
MSDS Date:06/01/1994
FSC:6810
NIIN:00D007574
MSDS Number: CGMSQ
=== Responsible Party ===
Company Name:POST APPLE SCIENTIFIC INC
Address:8893 GULF RD
City:NORTH EAST
State:PA
ZIP:16428-4298
Country:US
Info Phone Num:814-725-3330/FAX:814-725-8103
Emergency Phone Num:814-725-3330/800-424-9300 (CHEMTREC)
CAGE:EO236

==== Contractor Identification ====

Company Name:CHEM SCIENTIFIC INC
Address:1250 WASHINGTON ST
Box:City:NORWOOD
State:MA
ZIP:02062
Country:US
Phone:781-440-0900
CAGE:0X801
Company Name:POST APPLE SCIENTIFIC INC
Address:8893 GULF ROAD
Box:UNKNOW
City:NORTH EAST
State:PA
ZIP:16428-4298
Country:US
Phone:814-725-3330
CAGE:06JC6
Company Name:POST APPLE SCIENTIFIC INC FORMERLY GORDON POST LAB
Address:8893 GULF ROAD
Box:City:NORTH EAST
State:PA
ZIP:16428
Country:US
Phone:814-725-3330 FAX: 814-725-8103
CAGE:EO236

=====
Composition/Information on Ingredients
=====

Ingred Name:CHARCOAL (ANIMAL)
CAS:16291-96-6
RTECS #:FL7243500
Other REC Limits:NONE RECOMMENDED

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL, RAT) IS NOT KNOWN.

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:TARGET ORGANS:EYE, RESPIRATORY TRACT.
ACUTE- DUST MAY CAUSE MECHANICAL EYE IRRITATION. EFFECTS ON SKIN
UNKNOWN. DUST CAN CAUSE UPPER RESPIRATORY TRACT IRRITATION. MAY BE
HARMFUL IF INGESTED. CHRONIC- UNKNOWN.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION
Medical Cond Aggravated by Exposure:PERSONS WITH PRE-EXISTING EYE
PROBLEMS OR IMPAIRED RESPIRATORY FUNCTION MAY BE MORE SUSCEPTIBLE
TO THE EFFECTS OF THIS PRODUCT.

=====
===== First Aid Measures =====

First Aid:GET MEDICAL HELP IF SYMPTOMS PERSIST. INHALED:MOVE TO FRESH
AIR. EYES:FLUSH WITH WATER FOR 15 MINUTES, HOLDING EYELIDS OPEN.
SKIN:WASH WITH SOAP & WATER. ORAL:IF CONSCIOUS, RINSE OUT MOUTH
WITH WATER. SEEK MEDICAL ATTENTION.

=====
===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY, CARBON DIOXIDE, FOAM OR DRY CHEMICAL.
USE WATER SPRAY TO COOL FIRE EXPOSED CONTAINERS.
Fire Fighting Procedures:WEAR PROTECTIVE CLOTHING AND NIOSH-APPROVED
SELF-CONTAINED BREATHING APPARATUS. WATER STREAM CAN DISPERSE DUST
IN AIR, PRODUCING A FIRE HAZARD.
Unusual Fire/Explosion Hazard:POWDERED MATERIAL MAY FORM EXPLOSIVE
DUST-AIR MIXTURES.

=====
===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP SPILL. AVOID CREATING DUST. PLACE IN
APPROPRIATE CONTAINER FOR DISPOSAL. VENTILATE AREA AND WASH SPILL
SITE WITH WATER.
Neutralizing Agent:NOT RELEVANT

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN DRY PLACE. KEEP CONTAINER
TIGHTLY CLOSED. USE IN VENTILATED AREA.
Other Precautions:DO NOT RAISE DUST. AVOID CONTACT WITH EYES, SKIN OR
CLOTHING. AVOID INHALATION OF DUST. WASH THOROUGHLY AFTER HANDLING
MATERIAL. KEEP OUT OF REACH OF SMALL CHILDREN. DO NOT INGEST.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE NORMALLY REQUIRED. IF AIRBORNE
CONCENTRATION IS HIGH, WEAR A NIOSH-APPROVED DUST RESPIRATOR OR
DUST MASK.
Ventilation:GOOD GENERAL VENTILATION IS SUFFICIENT FOR MOST CONDITIONS
(10 ROOM VOLUMES PER HOUR).
Protective Gloves:LATEX TO MINIMIZE SKIN CONTACT
Eye Protection:SAFETY GLASSES/DUST GOGGLES RECOMMENDED
Other Protective Equipment:EYE WASH STATION, PROTECTIVE CLOTHING AND/OR
UNIFORM
Work Hygienic Practices:OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND
RECOMMENDED PROCEDURES.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:N1
NRC/State Lic Num:NOT RELEVANT
Viscosity:NOT RELEVANT
Evaporation Rate & Reference:NOT RELEVANT
Solubility in Water:INSOLUBLE
Appearance and Odor:BLACK SOLID

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
Hazardous Decomposition Products:CARBON MONOXIDE, CARBON DIOXIDE

===== Disposal Considerations =====

Waste Disposal Methods:THE POWDER MAY BE BURIED IN A SANITARY LANDFILL
OR INCINERATED. ENSURE COMPLIANCE WITH LOCAL, STATE AND FEDERAL
REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Anthrone, 98%

ACC# 96845

Section 1 - Chemical Product and Company Identification

MSDS Name: Anthrone, 98%

Catalog Numbers: AC104960250

Synonyms: 9(10H)-Anthracenone

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
90-44-8	Anthrone	98	201-994-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Caution! May cause eye, skin, and respiratory tract irritation. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Reduce airborne dust and prevent scattering by moistening with water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid breathing dust, mist, or vapor. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Anthrone	none listed	none listed	none listed

OSHA Vacated PELs: Anthrone: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 721 deg C @ 760 mm Hg

Freezing/Melting Point: 153 - 156 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₄H₁₀O

Molecular Weight: 194.23

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Light.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 90-44-8: CB8925500

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 90-44-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 90-44-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 90-44-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 90-44-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 90-44-8: 2

Canada - DSL/NDSL

CAS# 90-44-8 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Antimony

ACC# 01610

Section 1 - Chemical Product and Company Identification

MSDS Name: Antimony

Catalog Numbers: A845-500

Synonyms: Stibium; antimony regulus

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-36-0	ANTIMONY	>=99.5	231-146-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver white solid.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause blood abnormalities. May cause cardiac disturbances. Inhalation of fumes may cause metal-fume fever.

Target Organs: Kidneys, liver, cardiovascular system.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis.

Skin: Causes skin irritation. Chronic exposure may cause dizziness, dry throat, sleepiness, anorexia, and nausea. Chronic inhalation may result in liver, kidney, and cardiac changes.

Ingestion: May cause severe digestive tract irritation with abdominal pain, nausea,

vomiting and diarrhea. May cause slow pulse, low blood pressure, shallow breathing, and
Inhalation: Dust is irritating to the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may cause dizziness, dry throat, sleepiness, anorexia, and nausea. Chronic inhalation may result in liver, kidney, and cardiac changes.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will burn in a fire. Dust can be an explosion hazard when exposed to heat or flame. Bulk metal is combustible in air at high temperatures.

Extinguishing Media: DO NOT USE WATER, CO₂, OR FOAM DIRECTLY ON FIRE ITSELF. Use dry sand, graphite powder, dry sodium chloride-based extinguishers.

Flash Point: Not applicable.

Autoignition Temperature: 330 deg C (626.00 deg F)

Explosion Limits, Lower:0.42 oz/ft³

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes. Keep away from heat, sparks and flame. Avoid ingestion and inhalation.

Storage: Keep away from heat and flame. Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances. Tarnishes in moist air.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
ANTIMONY	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 50 mg/m ³ IDLH	0.5 mg/m ³ TWA

OSHA Vacated PELs: ANTIMONY: 0.5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: silver white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 1635 deg C
Freezing/Melting Point:630 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 6.684
Molecular Formula:Sb
Molecular Weight:121.71

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, ignition sources, moisture.

Incompatibilities with Other Materials: Incompatible with ammonium nitrate, bromine, bromine trifluoride, bromoazide, chloric acid, chlorine, chlorine monoxide, chlorine trifluoride, fluorine, iodine, nitric acid, potassium nitrate, potassium permanganate, potassium peroxide, sodium nitrate, and sodium peroxide.

Hazardous Decomposition Products: Stibine fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-36-0: CC4025000

LD50/LC50:

CAS# 7440-36-0:

Oral, rat: LD50 = 7 gm/kg;

Carcinogenicity:

CAS# 7440-36-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Present evidence in humans is inconclusive regarding an increased risk of lung cancer and reproductive disorders from antimony exposure.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ANTIMONY POWDER	ANTIMONY POWDER
Hazard Class:	6.1	6.1
UN Number:	UN2871	UN2871
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-36-0 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 7440-36-0: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7440-36-0: 5000 lb final RQ (no reporting of releases of this hazardous substance is required)

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7440-36-0: immediate, delayed.

Section 313

This material contains ANTIMONY (CAS# 7440-36-0, >=99.5%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 7440-36-0 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7440-36-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-36-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN N

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7440-36-0: No information available.

Canada - DSL/NDSL

CAS# 7440-36-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7440-36-0 is listed on the Canadian Ingredient Disclosure List.

Antimony trisulfide

- Antimony sulfide
- Antimony(III) sulfide

Formula	Sb_2S_3
Structure	$\text{S}^{2-} \quad \text{Sb}^{3+} \quad \text{S}^{2-} \quad \text{Sb}^{3+} \quad \text{S}^{2-}$
Description	Gray, lustrous, crystalline masses or grayish-black powder; also exists in.
Uses	In bengal fires, manufacture ruby glass, explosives.

Registry Numbers and Inventories.

CAS	1345-04-6
NIH PubChem CID	16689752
EC (EINECS/ELINCS)	215-713-4
RTECS	CC9450000
RTECS class	Tumorigen; Human Data
UN (DOT)	1325
Merck	12,754
Beilstein/Gmelin	9566 (G)
Swiss Giftliste 1	G-7683
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	S_3Sb_2
Formula mass	339.68
Melting point, °C	550
Decomposition point, °C	1050
Density	4.12 g/cm ³

Solubility in water	Insoluble
Heat of fusion	64.1 kJ/mol

Hazards and Protection.

Storage	Store in a cool, dry place. Store in a tightly closed container.
Handling	Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use only in a chemical fume hood.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Wash area with soap and water. Avoid generating dusty conditions.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents; acids.
Decomposition	Oxides of sulfur, hydrogen sulfide, antimony/antimony oxides.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Use foam, dry chemical, or carbon dioxide.
Fire potential	Flammable/combustible material. May be ignited by friction, heat, sparks or flames.
Combustion products	Dangerous; when heated to decompose or on contact with acid or acid fumes it emits highly toxic fumes of oxides of sulfur and antimony.

Health.

Exposure limit(s)	NIOSH REL*: TWA 0.5 mg/m3 OSHA PEL*: TWA 0.5 mg/m3 [*Note: REL and PEL also apply to other antimony compounds (as Sb).] IDLH 50 mg/m3 (as Sb)
Poison_Class	2
Exposure effects	Patients may acutely present with low heart rate, rapid heart rate, hyperventilation, respiratory depression even to the point of apnea, and/or hypo-/elevated blood pressure. Asphyxial seizures, coma, and death associated with rapid respiratory paralysis may be noted following exposure to high concentrations. Headache, sweating, vertigo, anosmia, irritability, staggering gait, disorientation, somnolence, weakness, confusion, and delirium may be noted following exposure to non-fatal levels. Spontaneous abortions have occurred after exposure to life-threatening

concentrations.

Ingestion May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation May cause respiratory tract irritation.

Skin May cause skin irritation.

Eyes May cause eye irritation.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number 1325

Response guide [133](#)

Hazard class 4.1

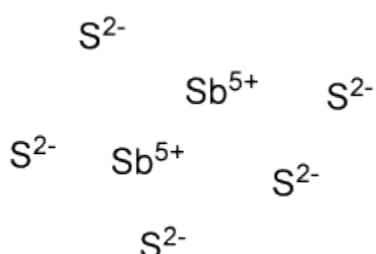


Packing Group II; III

USCG CHRIS Code ATW

Antimony pentasulfide

- Antimony sulfide, solid
- Antimony(V) sulfide
- Diantimony pentasulfide
- Antimony Red

Formula	Sb_2S_5
Structure	
Description	Orange solid.
Uses	Used as a pigment.

Registry Numbers and Inventories.

CAS	1315-04-4
NIH PubChem CID	16683083
EC (EINECS/ELINCS)	215-255-5
RTECS	CC6125000
RTECS class	Other
UN (DOT)	1325
Merck	12,738
Beilstein/Gmelin	44326 (G)
Swiss Giftliste 1	G-7682
Canada DSL/NDSL	NDSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	S_5Sb_2
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Formula mass	403.80
Melting point, °C	75 (decomposes)
Decomposition point, °C	75
Density	4.12 g/cm ³
Solubility in water	Reacts

Hazards and Protection.

Storage	Store in a cool, dry place. Store in a tightly closed container. Flammables-area.
Handling	Avoid breathing dust, vapor, mist, or gas. Avoid contact with skin and eyes.
Protection	Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Oxidizing agents.
Decomposition	Oxides of sulfur, hydrogen sulfide, antimony/antimony oxides.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Flammable solid. Extinguishing media: Use foam, dry chemical, or carbon dioxide. DO NOT USE WATER!
Fire potential	Flammable/combustible material. May be ignited by friction, heat, sparks or flames.
Combustion products	Emits toxic fumes under fire conditions.
<u>NFPA</u>	
Health	3
Flammability	1
Reactivity	1

Health.

Exposure limit(s)	NIOSH REL*: TWA 0.5 mg/m ³ OSHA PEL*: TWA 0.5 mg/m ³ [*Note: REL and PEL also apply to other antimony compounds (as Sb).] IDLH 50 mg/m ³ (as Sb)
Poison_Class	2
Exposure effects	The toxicological properties of this substance have not been fully investigated.
Ingestion	May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation Causes respiratory tract irritation.

Skin Causes skin irritation.

Eyes Causes eye irritation.

First aid

Ingestion Get medical aid. Wash mouth out with water.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 1325

Response guide [133](#)

Hazard class 4.1



Packing Group II; III

USCG CHRIS Code ATW

Material Safety Data Sheet

Antimony trioxide

ACC# 01780

Section 1 - Chemical Product and Company Identification

MSDS Name: Antimony trioxide

Catalog Numbers: AC192460000, AC192460100, AC192460500, AC213470000, AC213470010, AC213470050, AC213471000, A860-100, A860-500

Synonyms: Antimonious oxide; Antimony peroxide; Flowers of antimony.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1309-64-4	Antimony trioxide	99-100	215-175-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! Possible cancer hazard. May cause cancer based on animal data. Risk of cancer depends on duration and level of exposure. Causes eye irritation. May cause skin and respiratory tract irritation. May cause lung damage.

Target Organs: Lungs, eyes, skin.

Potential Health Effects

Eye: Contact produces irritation, tearing, and burning pain. May cause chemical conjunctivitis.

Skin: May cause skin irritation. Repeated or prolonged skin contact may cause antimony measles characterized by itchy papules and pustules around the sweat and fat glands.

Ingestion: May cause irritation of the digestive tract. May cause slow pulse, low blood pressure, bloody stool, shallow breathing, coma, convulsions, and possible death.

Inhalation: May cause respiratory tract irritation. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause lung damage. Antimony compounds may enter the body through the lungs. Inhalation may produce severe bronchitis with spasms, coughing, and chest pain.

Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged inhalation may cause respiratory tract inflammation and lung damage. Prolonged or repeated skin contact may cause dermatitis. Laboratory experiments have resulted in mutagenic effects. May cause chronic heart disease due to effects on the heart muscle. This substance has caused adverse reproductive and fetal effects in laboratory animals. Prolonged or excessive inhalation or ingestion exposures to Antimony or Antimony trioxide may result in inflammation of the lungs, airway obstruction, bronchospasm, chronic bronchitis, liver effects, blood effects, and neurological effects. Antimony trioxide has been identified by the EPA as a suspected lung

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Powder ignites and burns when heated. Containers may explode when heated.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Use only in a chemical fume hood.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Antimony trioxide	0.5 mg/m ³ TWA (listed under Antimony).	0.5 mg/m ³ TWA (listed under Antimony).50 mg/m ³ IDLH (listed under Antimony).	0.5 mg/m ³ TWA (listed under Antimony).

OSHA Vacated PELs: Antimony trioxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: Amphoteric.

Vapor Pressure: 1 mm Hg @ 574 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1456 deg C @ 760 mmHg

Freezing/Melting Point: 656.1 deg C

Decomposition Temperature: Not available.

Solubility: Slightly soluble in water.

Specific Gravity/Density: 5.2

Molecular Formula: Sb₂O₃

Molecular Weight: 291.4182

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, excess heat, moisture, high humidity.

Incompatibilities with Other Materials: Oxidizing agents, reducing agents, strong acids, bases, bromine trifluoride, halogenated agents, chlorinated rubber, halogenated acids.

Hazardous Decomposition Products: Antimony/antimony oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1309-64-4: CC5650000; CC5720000

LD50/LC50:

CAS# 1309-64-4:

Draize test, rabbit, eye: 100 mg Mild;

Oral, rat: LD50 = >34600 mg/kg;

Carcinogenicity:

CAS# 1309-64-4:

- **ACGIH:** A2 - Suspected Human Carcinogen (production)
- **California:** carcinogen, initial date 10/1/90
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: Antimony trioxide production is suspected of inducing human cancers on the basis of limited epidemiologic studies and has not assigned TLV.

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans. Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 833mg/l; 96H; Not specified Fish: Bluegill/Sunfish: 530mg/l; 96H; Not specified. 96 Hour LD50 bluegill sunfish: >530 mg/L. 96 Hour LD50 fathead minnow: >833 mg/L.

Environmental: Antimony is expected to exist as the trioxide in the atmosphere, since most of the atmospheric releases of antimony substances result from high temperature industrial processes, from the combustion of petroleum, petroleum products and coal, and from the incineration of products that contain antimony. Slight biodegradation but will bioconcentrate.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not regulated.

Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1309-64-4 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 1309-64-4: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 1309-64-4: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1309-64-4: immediate, delayed.

Section 313

This material contains Antimony trioxide (listed as Antimony), 99-100%, (CAS# 1309-64-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 1309-64-4 is listed as a Hazardous Substance under the CWA. CAS# 1309-64-4 is listed as a Priority Pollutant under the Clean Water Act. CAS# 1309-64-4 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1309-64-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Antimony trioxide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 22 Do not breathe dust.

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 1309-64-4: 2

Canada - DSL/NDSL

CAS# 1309-64-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1309-64-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Gum arabic

ACC# 95834

Section 1 - Chemical Product and Company Identification

MSDS Name: Gum arabic

Catalog Numbers: AC258850000, AC258850010, AC258850025, AC258850030, AC258852500, AC258855000 AC258855000

Synonyms: Acacia.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9000-01-5	Gum arabic	> 99	232-519-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: sand solid.

Warning! Causes severe eye irritation. May cause allergic respiratory reaction. Causes respiratory tract irritation. May cause allergic skin reaction. Causes skin irritation.

Target Organs: Lungs, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause hives. May cause dermatitis.

Ingestion: May cause irritation of the digestive tract. Ingestion may cause allergic

Inhalation: Dust is irritating to the respiratory tract. May cause allergic respiratory reaction. May cause asthmatic attacks due to allergic sensitization of the respiratory tract.

Chronic: Chronic inhalation may cause effects similar to those of acute inhalation.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Dusts at sufficient concentrations can form explosive mixtures with air. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Gum arabic	none listed	none listed	none listed

OSHA Vacated PELs: Gum arabic: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: sand

Odor: Not available.

pH: Neutral

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 1.35

Molecular Formula: Not applicable.

Molecular Weight: Not available

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Acacia precipitates or gels when added to ferric salts, borax, basic lead acetate, alcohol, sodium silicate, gelatin or ammoniated tincture of guaiac.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9000-01-5: CE5945000

LD50/LC50:

CAS# 9000-01-5:

Draize test, rabbit, eye: 36 mg/5H Severe;

Oral, mouse: LD50 = >16 gm/kg;

Oral, rabbit: LD50 = 8 gm/kg;

Oral, rat: LD50 = >16 gm/kg;

Carcinogenicity:

CAS# 9000-01-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9000-01-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 9000-01-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9000-01-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 42/43 May cause sensitization by inhalation and skin contact.

Safety Phrases:

S 22 Do not breathe dust.

S 24 Avoid contact with skin.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 9000-01-5: 0

Canada - DSL/NDSL

CAS# 9000-01-5 is listed on Canada's DSL List.

Canada - WHMIS

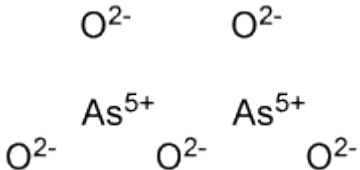
This product has a WHMIS classification of D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Arsenic pentoxide

- Arsenic acid anhydride
- Diarsenic pentaoxide
- Arsenic(V) oxide
- Arsenic anhydride
- Arsenic pentaoxide

Formula	As ₂ O ₅
Structure	
Description	A white crystalline solid.
Uses	Rodenticide, acaricide.

Registry Numbers and Inventories.

CAS	1303-28-2
NIH PubChem CID	14771
EC (EINECS/ELINCS)	215-116-9
EC Index Number	033-004-00-6
EC Class	Carc. Cat. 1; R45, T; R23/25, N; R50-53
RTECS	CG2275000
RTECS class	Agricultural Chemical and Pesticide; Tumorigen; Mutagen; Reproductive Effector
UN (DOT)	1559
Merck	12,839
Beilstein/Gmelin	17093 (G)
RCRA	P011
EPA OPP	6802
Swiss Giftliste 1	G-6980
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Philippiens PICCS	Listed

Properties.

Formula	As ₂ O ₅
Formula mass	229.84
Melting point, °C	730
Odor threshold	Odorless.
Density	4.09 g/cm ³ (25 C)
Solubility in water	658 g/L

Hazards and Protection.

Storage	Poison room locked.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get on skin or in eyes. Do not ingest or inhale. Use only in a chemical fume hood.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves and clothing to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Sweep up, then place into a suitable container for disposal.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Heat, acids, oxidizing agents, halogens, moist air or water.
Decomposition	Oxides of arsenic.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Extinguishing media: Use water spray to cool fire-exposed containers.
Fire potential	Arsenic pentoxide itself does not burn or burns with difficulty.
Hazards	Fire may produce irritating or poisonous gases. Reacts with metal and may give off toxic arsine gas. Hazardous polymerization may not occur.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.
NEPA	
Health	3
Flammability	0
Reactivity	0

Health.

Exposure limit(s)	TLV (as As): ppm; 0.01 mg/m ³ A1 (ACGIH 1997). MAK: class III A1 (1997).
Carcinogin	O, G-A1, I-1, N-1, CP65
Poison_Class	1
Exposure effects	Chronic ingestion is characterized by weakness, anorexia, gastrointestinal disturbances, impairment of cognitive function, peripheral neuropathy, and skin disorders. Chronic exposure may cause liver damage. Chronic ingestion may cause fetal effects.
Ingestion	May cause liver damage. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. Can cause nervous system damage. May cause bone marrow depression.
Inhalation	Causes respiratory tract irritation. May cause effects similar to those described for ingestion.
Skin	May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.
Eyes	May cause eye irritation. May result in corneal injury.
First aid	
Ingestion	If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately. Induce vomiting by giving one teaspoon of Syrup of Ipecac.
Inhalation	Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Skin	Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Eyes	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number	1559
Response guide	151
Hazard class	6.1
Packing Group	II
USCG CHRIS Code	APO
Std. Transport #	4923112



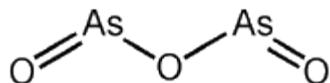
Arsenic trioxide

- Arsenous acid
- Arsenous oxide
- Arsenic(III) oxide
- Arsenous oxide anhydride
- Diarsenic trioxide
- Trisenox

Formula

As₂O₃

Structure



Description

Colorless, cubic or fibrous (arsenolite). Odorless.

Uses

Acaricide, rodenticide.

Registry Numbers and Inventories.

CAS	1327-53-3
NIH PubChem CID	14888
EC (EINECS/ELINCS)	215-481-4
EC Index Number	033-003-00-0
EC Class	Carc. Cat. 1; R45, T+; R28, C; R34, N; R50-53
RTECS	CG3325000
RTECS class	Agricultural Chemical and Pesticide; Tumorigen; Drug; Mutagen; Reproductive Effector; Human Data
UN (DOT)	1561
Merck	12,844
Beilstein/Gmelin	35185 (G)
RCRA	P012
EPA OPP	7001
Swiss Giftliste 1	G-1148
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	As ₂ O ₃
Formula mass	197.84
Melting point, °C	312
Boiling point, °C	465
Vapor pressure, mm_{Hg}	0.0002 (25 C)
Odor threshold	Odorless
Density	4.15 g/cm ³ (25 C)
Solubility in water	12 g/L
Dipole moment	0.13 D
Heat of fusion	18.4 kJ/mol
Heat of vaporization	125.1 kJ/mol

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not store in metal containers.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Do not allow contact with water.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Incompatible with chlorine trifluoride, fluorine, hydrogen fluoride, oxygen difluoride, and sodium chlorate. Can generate arsine, which is an extremely poisonous gas, when arsenic compounds contact acid, alkalis, or water in the presence of an active metal (zinc, aluminum, magnesium, manganese, sodium, iron, etc).
Decomposition	Irritating and toxic fumes and gases, oxides of arsenic, arsine.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers.
Fire potential	Nonflammable.
Hazards	Toxic fumes of arsenic trioxide and arsine may be formed in fire situations. Contact with halide acids will form toxic volatile halides. Reduction in acid solutions will form arsine. Arsenic trioxide and excess zinc filings will explode on heating. Avoid sodium chlorate; fluorine; chlorine trifluoride; chromic oxide; aluminum chloride; phosphorus pentoxide; hydrogen fluoride; oxygen difluoride, tannic acid; infusion cinchona and other vegetable astringent infusions and decoctions; iron in solution. It is stable in air but slowly oxidizes in acid media.
Combustion products	Toxic fumes of arsenic trioxide and arsine may be formed in fire situations.
NEPA	
Health	3
Flammability	0
Reactivity	0

Health.

Exposure limit(s)	TLV (as As): 0.01 ppm; A1 mg/m ³ (ACGIH 1996).
Carcinogen	O, G-A1, I-1, N-1, CP65
Poison_Class	1*
Exposure effects	May cause liver and kidney damage. Chronic inhalation may cause nasal septum ulceration and perforation. May cause anemia and other blood cell abnormalities. Chronic skin effects include: cracking, thickening, pigmentation, and drying of the skin. Arsenic trioxide can cause cancer in humans. Other long term effects include: anemia, liver and kidney damage. Chronic exposure to arsenical dust may cause breath shortness, nausea, chest pains, and garlic odor.
Ingestion	May be fatal if swallowed. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause hemorrhaging of the digestive tract. Ingestion of arsenical compounds may cause burning of the lips, throat constriction, swallowing difficulties, severe abdominal pain, severe nausea, projectile vomiting, and profuse diarrhea. Ingestion of arsenic compounds can produce convulsions, coma, and possibly death within 24 hours.
Inhalation	May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Inhalation of arsenic compounds may lead to irritation of the respiratory tract and leading to possible nasal perforation. Long-term exposure to arsenic compounds may produce impairment of peripheral circulation.
Skin	Causes irritation with burning pain, itching, and redness. May cause dermatitis. Exposure to arsenic compounds may produce hyperpigmentation of the skin and hyperkeratoses of plantar and palmar surfaces as well as both primary irritation and

sensitization types.

Eyes Contact produces irritation, tearing, and burning pain. May cause conjunctivitis.

First aid

Ingestion Induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration.

Skin Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 1561

Response guide [151](#)

Hazard class 6.1



Packing Group II

USCG CHRIS Code ATO

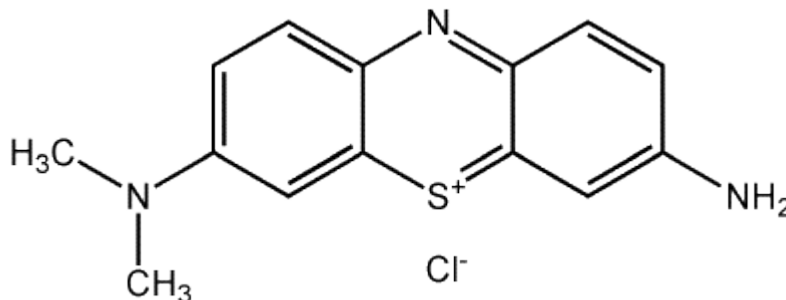
Std. Transport # 4923115

Azure A

- C.I. 52005
- Methylene Azur A
- N,N-Dimethylthionine
- 3-Amino-7-(dimethylamino)phenazathionium chloride
- 5-Chloro-3-dimethylamino-7-amino-5H-phenothiazine
- 3-Amino-7-(dimethylamino)phenothiazin-5-ium chloride

Formula C₁₄H₁₄ClN₃S

Structure



Description Solid.

Uses Biological stain.

Registry Numbers and Inventories.

CAS	531-53-3
NIH PubChem CID	13735
EC (EINECS/ELINCS)	208-510-7
RTECS	SP5660000
RTECS class	Mutagen
Merck	12,957
Beilstein/Gmelin	3922287
Beilstein Reference	4-27-00-05151
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed

Properties.

Formula	C ₁₄ H ₁₄ ClN ₃ S
Formula mass	291.79

Melting point, °C	290
Density	1.776 g/cm ³ (22 C)

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Wash thoroughly after handling. Use with adequate ventilation. Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents.
Decomposition	Hydrogen chloride, nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. To extinguish fire use water spray, dry chemical, carbon dioxide, or chemical foam.
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Health.

Exposure effects

Ingestion	May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.
Inhalation	May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.
Skin	May cause skin irritation.
Eyes	May cause eye irritation.
First aid	
Ingestion	If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation	Remove from exposure to fresh air immediately. Get medical aid if cough or other symptoms appear.
Skin	Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.
Eyes	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Material Safety Data Sheet

Barbituric acid

ACC# 02264

Section 1 - Chemical Product and Company Identification

MSDS Name: Barbituric acid

Catalog Numbers: AC180920000, AC180925000, 18092-1000, O1308-100, O1309-100

Synonyms: 2,4,6(1H,3H,5H)-Pyrimidinetrione.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-52-7	Barbituric acid	99+	200-658-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: cream crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause liver and kidney damage. Exposure to high concentrations may cause central nervous system depression.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 150 deg C (302.00 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barbituric acid	none listed	none listed	none listed

OSHA Vacated PELs: Barbituric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: cream

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 248 - 255 deg C

Decomposition Temperature: 250 deg C

Solubility: 142 g/L (20°C)

Specific Gravity/Density: Not available.

Molecular Formula: C₄H₄N₂O₃

Molecular Weight: 128.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated.

Conditions to Avoid: High temperatures, incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 67-52-7: CP8000000

LD50/LC50:

CAS# 67-52-7:

Oral, rat: LD50 = >5 gm/kg;

Carcinogenicity:

CAS# 67-52-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 67-52-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 67-52-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 67-52-7: 0

Canada - DSL/NDSL

CAS# 67-52-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Barium nitrate

ACC# 02440

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium nitrate

Catalog Numbers: AC203150000, AC203150050, AC203155000, B53-500, NC9344971

Synonyms: Barium dinitrate; Nitric acid, barium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10022-31-8	Barium nitrate	100	233-020-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Harmful if inhaled or swallowed. Causes eye, skin, and respiratory tract irritation. May cause central nervous system effects. May cause kidney damage. May cause cardiac disturbances.

Target Organs: Kidneys, central nervous system, muscles, cardiovascular system.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause kidney damage. Ingestion of nitrate containing compounds can lead to methemoglobinemia. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea,

vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. The barium ion stimulates cardiac, smooth and striated muscle. Various motor disturbances including stiffness, cramps, weakness or paralysis of the musculature may be seen with exposure to soluble barium salts. Central nervous system stimulation may be seen followed by depression.

Inhalation: Harmful if inhaled. Causes respiratory tract irritation. Inhalation at high concentrations may cause CNS depression and asphyxiation.

Chronic: Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood. Institute cardiac monitoring for all significant ingestions of soluble barium salts. Institute cardiac monitoring for all significant ingestions of soluble barium salts.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire.

Extinguishing Media: Use water spray to cool fire-exposed containers. Contact professional fire-fighters immediately. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires, flood fire area with water from a distance.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barium nitrate	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).	0.5 mg/m ³ TWA (as Ba) 50 mg/m ³ IDLH (as Ba)	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).

OSHA Vacated PELs: Barium nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: white
Odor: odorless
pH: 5.0-8.0, 5% Aq. soln.
Vapor Pressure: Negligible.
Vapor Density: 9.0
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Decomposes.
Freezing/Melting Point: 592 deg C
Decomposition Temperature: > 592 deg C
Solubility: moderate
Specific Gravity/Density: 3.24 @23C
Molecular Formula: Ba(NO₃)₂
Molecular Weight: 261.34

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Reducing agents, acids, bases, aluminum, hydroxylamine, magnesium, phosphorus, zinc, esters (e.g. butyl acetate, ethyl acetate, propyl formate), combustible and flammable materials (e.g. alkyl resins, asphalt, gasoline, grease, methyl acetone, polystyrene, polyurethane), acid anhydrides, tin chloride.
Hazardous Decomposition Products: Nitrogen oxides, barium oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10022-31-8: CQ9625000
LD50/LC50:
CAS# 10022-31-8:
Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, mouse: LD50 = 266 mg/kg;
Oral, rat: LD50 = 355 mg/kg;
Oral, rat: LD50 = 390 mg/kg;

Carcinogenicity:

CAS# 10022-31-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Terrestrial: Increases the mobility of other elements in the soil. Has a high bioconcentration potential.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BARIUM NITRATE	BARIUM NITRATE
Hazard Class:	5.1	5.1(6.1)
UN Number:	UN1446	UN1446
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10022-31-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10022-31-8: immediate, fire.

Section 313

This material contains Barium nitrate (listed as Barium compounds, n.o.s.), 100%, (CAS# 10022-31-8) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10022-31-8 can be found on the following state right to know lists: California, (listed as Barium, soluble compounds), New Jersey, Pennsylvania, Minnesota, (listed as Barium, soluble compounds), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 10022-31-8: 1

Canada - DSL/NDSL

CAS# 10022-31-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10022-31-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Barium chloride, anhydrous

ACC# 02370

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium chloride, anhydrous

Catalog Numbers: AC612281000, B31-100C, B31-500, B35

Synonyms: Barium dichloride.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10361-37-2	Barium chloride	> 97	233-788-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. May cause lung damage. May cause cardiac disturbances. May cause kidney damage.

Target Organs: Kidneys, heart, respiratory system, muscles.

Potential Health Effects

Eye: Contact produces irritation, tearing, and burning pain. May cause conjunctivitis.

Skin: Causes skin irritation. Prolonged contact with the skin, especially if the skin is wet or moist, causes necrosis.

Ingestion: Harmful if swallowed. May cause kidney damage. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. Barium chloride affects the muscles (especially the smooth muscles of the cardiovascular and respiratory systems), causes salivation, tingling of the mouth or face, convulsions, numbness, muscle paralysis, respiratory failure, slow pulse rate, pulmonary edema, irregular heart beat, potassium deficiency in the

Inhalation: Harmful if inhaled. Causes respiratory tract irritation. May cause effects similar to those described for ingestion.

Chronic: Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Do NOT use mouth-to-mouth resuscitation.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barium chloride	none listed	0.5 mg/m ³ TWA (as Ba) 50 mg/m ³ IDLH	none listed

OSHA Vacated PELs: Barium chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not applicable.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 1560 deg C
Freezing/Melting Point: 960 deg C
Decomposition Temperature: Not available.
Solubility: 59% @ 100°C
Specific Gravity/Density: 3.86
Molecular Formula: BaCl₂
Molecular Weight: 208.27

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation, excess heat.
Incompatibilities with Other Materials: Bromine trifluoride, Furan-2-peroxycarboxylic acid.
Hazardous Decomposition Products: Hydrogen chloride, chlorine.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10361-37-2: CQ8750000
LD50/LC50:
CAS# 10361-37-2:
Oral, mouse: LD50 = 150 mg/kg;
Oral, rat: LD50 = 118 mg/kg;
Oral, rat: LD50 = 397 mg/kg;

Carcinogenicity:
CAS# 10361-37-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Barium chloride accumulates in plants when it exceeds calcium and magnesium levels in soil.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BARIUM COMPOUNDS, N.O.S.	BARIUM COMPOUNDS, N.O.S. (BARIUM CHLORIDE)
Hazard Class:	6.1	6.1
UN Number:	UN1564	UN1564
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10361-37-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10361-37-2: immediate, delayed.

Section 313

This material contains Barium chloride (listed as Barium compounds, n.o.s.), > 97%, (CAS# 10361-37-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10361-37-2 can be found on the following state right to know lists: New Jersey, (listed as Barium compounds, n.o.s.), Pennsylvania, (listed as Barium compounds, n.o.s.).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 25 Toxic if swallowed.

R 20 Harmful by inhalation.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 10361-37-2: 1

Canada - DSL/NDSL

CAS# 10361-37-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10361-37-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Barium hydroxide, anhydrous

ACC# 02420

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium hydroxide, anhydrous

Catalog Numbers: 61242-2500, 61242-5000, B47-250, B47-500

Synonyms: Barium dihydroxide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
17194-00-2	Barium hydroxide anhydrous	>95	241-234-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: transparent solid.

Danger! Causes burns by all exposure routes. Harmful if inhaled or swallowed. May cause blood abnormalities. May cause kidney damage. May cause central nervous system effects.

Target Organs: Kidneys, central nervous system, respiratory system, gastrointestinal system, muscles, cardiovascular system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause respiratory failure. May cause kidney failure. May cause convulsions, increased blood pressure, muscle spasms, and possible paralysis.

Inhalation: Harmful if inhaled. Causes chemical burns to the respiratory tract.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Use only with adequate ventilation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barium hydroxide anhydrous	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).	0.5 mg/m ³ TWA (as Ba, except barium sulfate) (listed under Barium, soluble compounds).	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).

OSHA Vacated PELs: Barium hydroxide anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: transparent

Odor: odorless

pH: Alkaline.

Vapor Pressure: Negligible.
Vapor Density: 10.9
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 780 deg C
Freezing/Melting Point: 78 deg C
Decomposition Temperature: Not available.
Solubility: Moderately in water (5.6 g/100 ml)
Specific Gravity/Density: 2.18
Molecular Formula: BaH₂O₂
Molecular Weight: 171.34

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Substance readily absorbs carbon dioxide from air.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Metals, strong oxidizing agents, acids.

Hazardous Decomposition Products: Barium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 17194-00-2: CQ9200000

LD50/LC50:

CAS# 17194-00-2:

Oral, rat: LD50 = 308 mg/kg;

Carcinogenicity:

CAS# 17194-00-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLIDS, TOXIC, N.O.S.	CORROSIVE SOLID, TOXIC, N.O.S.
Hazard Class:	8	8
UN Number:	UN2923	UN2923
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 17194-00-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 17194-00-2: immediate, delayed.

Section 313

This material contains Barium hydroxide anhydrous (listed as Barium compounds, n.o.s.), >95%, (CAS# 17194-00-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 17194-00-2 can be found on the following state right to know lists: California, (listed as Barium, soluble compounds), New Jersey, (listed as Barium compounds, n.o.s.), Pennsylvania, (listed as Barium compounds, n.o.s.), Minnesota, (listed as Barium, soluble compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 34 Causes burns.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 17194-00-2: 1

Canada - DSL/NDSL

CAS# 17194-00-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 17194-00-2 (listed as Barium, soluble compounds) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Basic Fuchsin

ACC# 96948

Section 1 - Chemical Product and Company Identification

MSDS Name: Basic Fuchsin

Catalog Numbers: AC401690000, 40169-0250

Synonyms: Basic Violet 14, hydrochloride; C.I. 42510; Rosaniline chloride.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
632-99-5	Basic Fuchsin	88+	211-189-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Warning! Harmful if swallowed. Cancer hazard. May cause eye, skin, and respiratory tract irritation. May cause blood abnormalities.

Target Organs: Blood, blood forming organs.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Exposure may cause anemia and other blood abnormalities.

Inhalation: May cause respiratory tract irritation. May cause effects similar to those described for ingestion. May be harmful if inhaled.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Prolonged exposure may cause anemia and methemoglobinemia, characterized by dizziness, drowsiness, headache, breath shortness, cyanosis (bluish skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood. May cause cancer in humans.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 200 deg C (392.00 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use only in a well-ventilated area. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Basic Fuchsin	none listed	none listed	none listed

OSHA Vacated PELs: Basic Fuchsin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green

Odor: faint odor

pH: 5 - 6 (1 g/L aq.sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 250 deg C (decom)

Decomposition Temperature:250 deg C

Solubility: 4 g/L (25°C)

Specific Gravity/Density:Not available.

Molecular Formula:C₂₀H₂₀ClN₃

Molecular Weight:337.84

Section 10 - Stability and Reactivity

Chemical Stability: Moisture sensitive.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, acids, alkalies.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 632-99-5: CX9850000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 632-99-5:

- **ACGIH:** Not listed.
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 1 carcinogen

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 632-99-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 632-99-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 632-99-5: No information available.

Canada - DSL/NDSL

CAS# 632-99-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

ACROS ORGANICS -- 3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE, 99%, 18447-0000 -- 6505-00N092383

=====
===== Product Identification =====

Product ID:3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE, 99%, 18447-0000
MSDS Date:07/16/1996
FSC:6505
NIIN:00N092383
Status Code:A
MSDS Number: CJRPC
=== Responsible Party ===
Company Name:ACROS ORGANICS
Address:ONE REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:800-227-6701
Emergency Phone Num:800-424-9300
Chemtrec Ind/Phone:(800)424-9300
CAGE:ACROS

==== Contractor Identification ====

Company Name:ACROS ORGANICS
Address:ONE REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Phone:800-227-6701
CAGE:ACROS

=====
===== Composition/Information on Ingredients =====

Ingred Name:3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE
CAS:20325-40-0
RTECS #:DD1050000
= Wt:99.

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NOT AVAILABLE.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:HARMFUL IF SWALLOWED. MAY CAUSE
CANCER. CANCER SUSPECT AGENT.
Explanation of Carcinogenicity:3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE
- CALIFORNIA: CARCINOGEN - INITIAL DATA 10/1/90; NTP: SUSPECT
CARCINOGEN; OSHA - POSSIBLE SELECT CARCINOGEN (MFR).
Effects of Overexposure:SEE HEALTH HAZARDS.

=====
===== First Aid Measures =====

First Aid:EYES: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15
MINUTES, OCCASIONALLY LIFTING UPPER AND LOWER LIDS. SKIN: FLUSH
WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES WHILE
REMOVING CONTAMINATED CLOTHING AND SHOES. INGESTION: DO NOT INDUCE

VOMITING. ALLOW VICTIM TO RINSE HIS MOUTH AND THEN TO DRINK 2-4 CUPFULS OF WATER, AND SEEK MEDICAL ADVICE. INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. NOTES TO MD: TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

=====
===== Fire Fighting Measures =====

Flash Point:NOT AVAILABLE
Autoignition Temp:Autoignition Temp Text:N/AV
Lower Limits:NOT AVAIL
Upper Limits:NOT AVAIL
Extinguishing Media:IN CASE OF FIRE, USE WATER, DRY CHEMICAL, CHEMICAL FOAM, OR ALCOHOL-RESISTANT FOAM.
Fire Fighting Procedures:USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NFPA RATING: NOT PUBLISHED.

=====
===== Accidental Release Measures =====

Spill Release Procedures:USE PROPER PERSONAL PROTECTIVE EQUIPMENT AS INDICATED IN EXPOSURE CONTROLS, PERSONAL PROTECTION SECTION. SWEEP UP, THEN PLACE INTO A SUITABLE CONTAINER FOR DISPOSAL.

=====
===== Handling and Storage =====

Handling and Storage Precautions:USE APPROPRIATE PROCEDURES TO PREVENT OPPORTUNITIES FOR DIRECT CONTACT WITH THE SKIN OR EYES AND TO PREVENT INHALATION.
Other Precautions:IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE). AVOID EXPOSURE - OBTAIN SPECIAL INSTRUCTIONS BEFORE USE.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH OR EUROPEAN EN STANDARD EN 149 APPROVED FULL-FACEPIECE AIRLINE RESPIRATOR IN THE POSITIVE PRESSURE MODE WITH EMERGENCY ESCAPE PROVISIONS.
Ventilation:USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP AIRBORNE CONCENTRATIONS BELOW THE PERMISSIBLE EXPOSURE LIMITS.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:ANSI APPROVED CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:ANSI APPROVED EYE WASH & DELUGE SHOWER . WEAR APPROPRIATE PROTECTIVE CLOTHING TO MINIMIZE CONTACT WITH SKIN AND TO PREVENT SKIN EXPOSURE.
Supplemental Safety and Health
PHYSICAL AND CHEMICAL PROPERTIES: MOLECULAR FORMULA: NOT AVAILABLE.
MOLECULAR WEIGHT: 317.21.

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:NOT AVAILABLE
Melt/Freeze Pt:=268.C, 514.4F
Decomp Temp:Decomp Text:NOT AVAILABLE
Vapor Pres:NOT AVAILABLE
Vapor Density:NOT AVAIL
Spec Gravity:NOT AVAILABLE
pH:NOT AVAILABLE

Viscosity:NOT AVAILABLE
Solubility in Water:NOT AVAILABLE
Appearance and Odor:GREY-PURPLE POWDER; NO ODOR AVAILABLE.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:STABLE UNDER NORMAL TEMPERATURES AND
PRESSURES. AVOID INCOMPATIBLE MATERIALS.
Hazardous Decomposition Products:HYDROGEN CHLORIDE, NITROGEN OXIDES,
CARBON MONOXIDE, CARBON DIOXIDE, NITROGEN.
Conditions to Avoid Polymerization:HAS NOT BEEN REPORTED.

===== Toxicological Information =====

Toxicological Information:THE TOXICOLOGICAL PROPERTIES OF THIS MATERIAL
HAVE NOT BEEN INVESTIGATED. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE
INFORMATION.

===== Ecological Information =====

Ecological:FOR FURTHER INFORMATION, CONTACT ACROS ORGANICS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL,
STATE AND LOCAL REGULATIONS.

===== MSDS Transport Information =====

Transport Information:U.S. DOT: SHIPPING NAME: TOXIC SOLID, ORGANIC,
N.O.S. HAZARD CLASS: 6.1. UN NUMBER: 2811. PACKING GROUP: III. --
I.M.O.: SHIPPING NAME: TOXIC SOLID, ORGANIC, N.O.S. HAZARD CLASS:
6.1. UN NUMBER: 2811. PACKING GROUP: III. -- I.A.T.A.: SHIPPING
NAME: TOXIC SOLID, ORGANIC, N.O.S. HAZARD CLASS: 6.1. UN NUMBER:
2811. PACKING GROUP III. -- R.I.D./A.D.R.:SHIPPING NAME:TOXIC
SOLID, ORGANIC, N.O.S. UN NUMBER: 2811. DANGEROUS GOODS CODE: 6.1
(25C). -- CANADIAN T.D.G.: SHIPPING NAME: POISONOUS SOLID NOS
(DIMETHOXYBENZIDINE DIHYDROCHLOR). HAZARD CLASS: 6.1 (9.2). UN
NUMBER: UN2811.

===== Regulatory Information =====

Federal Regulatory Information:EUROPEAN/INTERNATIONAL REGS: EUROPEAN
LABELING I/A/W EC DIRECTIVES: HAZ SYMBOLS: T. RISK PHRASES: R 22 -
HARMFUL IF SWALLOWED; F 45 - MAY CAUSE CANCER. SAFETY PHRASES: S 45
- IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MED ADVICE IMMED
(SHOW LABEL WHERE POSS); S 53 - AVOID EXPOS - OBTAIN SPECIAL
INSTRUCTIONS BEFORE USE. WGK (WATER DANGER/PROT): CAS #20325-40-0:
NO INFO AVAIL. CANADA: CAS #20325-40-0 IS LISTED ON CANADA'S
DSL/NDSL LIST; CAS #20325-40-0 IS NOT LISTED ON CANADA'S ING
DISCLOSURE LIST. EXPOS LIMS: N/P. U.S. FEDERAL: TSCA: CAS
#20325-40-0 IS LISTED ON THE TSCA INVENTORY.

===== Other Information =====

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SIGMA CHEMICAL CO -- BENZIDINE DIHYDROCHLORIDE, B3383 -- 6810-00N089701

=====
Product Identification
=====

Product ID: BENZIDINE DIHYDROCHLORIDE, B3383

MSDS Date: 07/01/1994

FSC: 6810

NIIN: 00N089701

Status Code: A

MSDS Number: CHWLB

=== Responsible Party ===

Company Name: SIGMA CHEMICAL CO

Box: 14508

City: ST LOUIS

State: MO

ZIP: 63178

Country: US

Info Phone Num: 800-325-3010

Emergency Phone Num: 314-771-5765

CAGE: 21076

=== Contractor Identification ===

Company Name: SIGMA CHEMICAL COMPANY

Address: 3050 SPRUCE ST

Box: 14508

City: ST LOUIS

State: MO

ZIP: 63178

Country: US

Phone: 314-771-5765

CAGE: 21076

=====
Composition/Information on Ingredients
=====

Ingred Name: BENZIDINE, DIHYDROCHLORIDE

CAS: 531-85-1

OSHA PEL: N/K

ACGIH TLV: N/K

=====
Hazards Identification
=====

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES

Reports of Carcinogenicity: NTP: NO IARC: NO OSHA: NO

Health Hazards Acute and Chronic: ACUTE: MAY BE FATAL IF INHALED,

SWALLOWED/ABSORBED THRU SKIN. READILY ABSORBED THRU SKIN. CAUSES

EYE & SKIN IRRIT. MATL IS IRRIT TO MUC MEMBS & UPPER RESP TRACT.

EXPOS CAN CAUSE DMG TO LIVER/KIDNEYS, BLOOD EFTS, DERM. OTHER

SYMPS OF EXPOS CAN INCL NAUS, VOMIT, PAINFUL & IRREG URINATION.

CHRONIC: CARCIN. (EFTS OF OVEREXP)

Explanation of Carcinogenicity: NOT RELEVANT

Effects of Overexposure: HLTH HAZ: MUTAGEN. TARGET ORG(S): BLADDER, LIVER,

KIDNEYS, SKIN, BLOOD. TO THE BEST OF MFR'S KNOWLEDGE, CHEM,

PHYSICAL & TOX PROPERTIES HAVE NOT BEEN THORO INVESTIGATED. TARGET

ORG DATA: LIVER, ENDOCRINE, SKIN & APPENDAGES (TUMORS); TUMORIGENIC

(CARCIN BY RTECS CRITERIA; EQUIVOCAL TUMORIGENIC AGENT BY RTECS

CRITERIA).

Medical Cond Aggravated by Exposure: NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:INGEST:WASH OUT MOUTH W/WATER PROVIDE PERS IS CONSCIOUS. CALL MD. SKIN:FLUSH W/COPIOUS AMTS OF WATER FOR AT LST 15 MINS. REMOVE CONTAM CLTHG & SHOES. CALL MD. DISCARD CONTAM CLTHG & SHOES. INHAL:REMOV E TO FRESH AIR. IF BRTHG BECOMES DFCLT,CALL MD. EYES:FLUSH W/COPIOUS AMTS OF ATER FOR AT LST 15 MINS. ASSURE ADEQ FLUSHING BY SEPARATING LIDS W/FINGERS. CALL MD.

=====
Fire Fighting Measures
=====

Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
Fire Fighting Procedures:USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
Accidental Release Measures
=====

Spill Release Procedures:EVACUATE AREA. FULL-PROT CLTHG. NIOSH APPRVD SCBA SHOULD BE WORN. COVER W/9:1 MIXT OF SAND & SODA ASH. AFTER MIXING, TRANSFER INTO PAPER CARTON. AVOID RAISING DUST. VENT AREA & WASH SPILL SITE AFTER M ATL PICKUP IS COMPLETE.
Neutralizing Agent:9:1 MIXTURE OF SAND & SODA ASH.

=====
Handling and Storage
=====

Handling and Storage Precautions:DO NOT BREATHE DUST. DO NOT GET IN EYES, ON SKIN, ON CLTHG. AVOID PRLNG/RPTD EXPOS. HIGHLY TOXIC. IRRITANT. MUTAGEN. CARCINOGEN. KEEP TIGHTLY CLOSED.
Other Precautions:MAY CAUSE CANCER. MAY CAUSE HERITABLE GENETIC DAMAGE. VERY TOXIC BY INHALATION, IN CONTACT W/SKIN & IF SWALLOWED. IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW LABEL WHERE POSSIBLE).

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS SHOULD BE WORN.
Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves:HEAVY RUBBER GLOVES.
Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .
Other Protective Equipment:EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA .
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

=====
Physical/Chemical Properties
=====

Melt/Freeze Pt:M.P/F.P Text:>572F,>300C
Solubility in Water:SOLUBLE
Appearance and Odor:NONE SPECIFIED BY MANUFACTURER.

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid: YES
STRONG OXIDIZING AGENTS. WILL IGNITE ON CONTACT W/RED FUMING NITRIC
ACID.

Stability Condition to Avoid: HEAT.

Hazardous Decomposition Products: TOXIC FUMES OF: CARBON MONOXIDE,
CARBON DIOXIDE, NITROGEN OXIDES, HYDROGEN CHLORIDE GAS.

===== Disposal Considerations =====

Waste Disposal Methods: DISSOLVE OR MIX MATERIAL W/COMBUSTIBLE SOLVENT &
BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.
OBSERVE ALL FEDERAL, STATE & LOCAL ENVIRONMENTAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Bismuth nitrate

ACC# 90071

Section 1 - Chemical Product and Company Identification

MSDS Name: Bismuth nitrate

Catalog Numbers: S75055, S93140

Synonyms: Nitric acid, bismuth(+3) salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10361-44-1	Bismuth nitrate	100	233-791-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. May cause methemoglobinemia. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: May cause irritation of the digestive tract. Ingestion of nitrate containing compounds can lead to methemoglobinemia.

Inhalation: Dust is irritating to the respiratory tract. May cause methemoglobinemia,

cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: May cause kidney injury. May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood.

Antidote: Methylene blue, alone or in combination with oxygen is indicated as a treatment in nitrite induced methemoglobinemia.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire.

Extinguishing Media: May require flooding with water in order to eliminate hazardous reactions since the materials generate their own oxygen.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep from contact with clothing and other combustible materials. Avoid breathing dust. Inform laundry personnel of contaminant's hazards.
Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bismuth nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Bismuth nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate clothing to prevent skin exposure.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: white
Odor: No data
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:30 deg C
Decomposition Temperature:Not available.
Solubility: Decomposed by water.
Specific Gravity/Density:2.83
Molecular Formula:BiN3O9
Molecular Weight:394.9987

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, dust generation, moisture.

Incompatibilities with Other Materials: Reducing agents, strong acids, finely powdered metals, organic materials, combustible materials.

Hazardous Decomposition Products: Nitrogen oxides, bismuth oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10361-44-1: EB2984400

LD50/LC50:

CAS# 10361-44-1:

Oral, mouse: LD50 = >357 mg/kg; <BR.

Carcinogenicity:

CAS# 10361-44-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found.

Teratogenicity: No information found.

Reproductive Effects: See actual entry in RTECS for complete information.

Mutagenicity: No information found.

Neurotoxicity: No information found.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	NITRATES INORGANIC NOS (BISMUTH NITRATE, 5HYDRATE)
Hazard Class:		5.1
UN Number:		UN1477
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10361-44-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10361-44-1: flammable.

Section 313

This material contains Bismuth nitrate (listed as Water Dissociable Nitrate Compounds), 100%, (CAS# 10361-44-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10361-44-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 10361-44-1: No information available.

Canada - DSL/NDSL

CAS# 10361-44-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

Canadian Ingredient Disclosure List

CAS# 10361-44-1 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Bismuth subnitrate

ACC# 89455

Section 1 - Chemical Product and Company Identification

MSDS Name: Bismuth subnitrate

Catalog Numbers: AC611355000, B344-500

Synonyms: Bismuth hydroxide nitrate oxide; Basic bismuth nitrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1304-85-4	Bismuth subnitrate	90	215-136-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. May cause methemoglobinemia.

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood. Ingestion of nitrate containing compounds can lead to methemoglobinemia. May cause visual changes with

blurred vision. Opacities may form in the cornea.

Inhalation: May cause effects similar to those described for ingestion.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use flooding quantities of water as spray.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid contact with clothing and other combustible materials. Avoid breathing dust. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Store in a cool, dry place. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bismuth subnitrate	none listed	none listed	none listed

OSHA Vacated PELs: Bismuth subnitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 260 deg C

Decomposition Temperature:260 deg C

Solubility: Insoluble.

Specific Gravity/Density:4.93 g/cm³

Molecular Formula:Bi₅O(OH)₉(NO₃)₄

Molecular Weight:1462.03

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Light, dust generation, excess heat.

Incompatibilities with Other Materials: Strong reducing agents, sulfur, iodides, bicarbonates, calomel, tannin, organic materials, gallic acid, salicylic acid, combustible materials.

Hazardous Decomposition Products: Nitrogen oxides, bismuth oxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 1304-85-4: EB2977000

LD50/LC50:

Not available.

Infant TDLo oral; Dose: 259 mg/kg. Toxic effects: Blood - methemoglobinemia - carboxyhemoglobin.

Carcinogenicity:

CAS# 1304-85-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NITRATES, INORGANIC, N.O.S.	NITRATES, INORGANIC, N.O.S.
Hazard Class:	5.1	5.1
UN Number:	UN1477	UN1477
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1304-85-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Bismuth subnitrate (listed as Water Dissociable Nitrate Compounds), 90%, (CAS# 1304-85-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1304-85-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI O

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 1304-85-4: No information available.

Canada - DSL/NDSL

CAS# 1304-85-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1304-85-4 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Boric acid, reagent acs (crystals)

ACC# 95423

Section 1 - Chemical Product and Company Identification

MSDS Name: Boric acid, reagent acs (crystals)

Catalog Numbers: AC423480000, AC423480020, AC423485000

Synonyms: Boracic Acid; Hydrogen Borate; Orthoboric Acid.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-35-3	Boric acid	99.0	233-139-2

Hazard Symbols: None listed.

Risk Phrases: None listed.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. **Caution!** May cause eye and skin irritation. May cause central nervous system effects. May cause respiratory tract irritation. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. Can cause adverse reproductive effects. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

Target Organs: Kidneys, central nervous system, cardiovascular system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be absorbed through damaged or abraded skin in harmful amounts.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness,

coma and possible death due to respiratory failure. May cause tissue anoxia, characterized by weakness, headache, dizziness, confusion, cyanosis (bluish skin due to deficient oxygenation of the blood), weak and irregular heart beat, collapse, unconsciousness, convulsions, coma and death.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic poisoning by boron compounds, borism, may be little more than dry skin and mucous membranes, followed by appearance of a red tongue, patchy alopecia (hair loss), cracked lips, and conjunctivitis. Infants and young children are more susceptible to boric acid poisoning than adults.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Boric acid	none listed	none listed	none listed

OSHA Vacated PELs: Boric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 5.2 (1% sol. at 20C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: 339 deg F
Decomposition Temperature: Not available.
Solubility: 4.9g/100g water at 20C.
Specific Gravity/Density: 1.44 (Water=1)
Molecular Formula: H₃BO₃
Molecular Weight: 61.8292

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, dust generation.

Incompatibilities with Other Materials: Incompatible with acetic anhydride and potassium. Reacts with basic materials to form borate salts.

Hazardous Decomposition Products: Oxides of boron.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10043-35-3: ED4550000; ED4560000

LD50/LC50:

CAS# 10043-35-3:

Oral, mouse: LD50 = 3450 mg/kg;

Oral, rat: LD50 = 2660 mg/kg;

Oral, rat: LD50 = 2500 mg/kg; <BR.

Carcinogenicity:

CAS# 10043-35-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: None.

Section 12 - Ecological Information

Ecotoxicity: Water flea Daphnia: LC50 = 115.0-153.0 mg/L; 48 Hr.; Static Condition

Mosquito fish (fresh water) TLM=1800 ppm/24H Mosquito fish (fresh water) TLM=1800 ppm/24H

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-35-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 10043-35-3: acute, chronic.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-35-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 10043-35-3: 1

Canada - DSL/NDSL

CAS# 10043-35-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List

CAS# 10043-35-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 10043-35-3: OEL-RUSSIA: STEL 10 mg/m³

Material Safety Data Sheet

Boric acid, powder, 99+%

ACC# 95421

Section 1 - Chemical Product and Company Identification

MSDS Name: Boric acid, powder, 99+%

Catalog Numbers: AC180570000, AC180570010, AC180570025

Synonyms: Boracic Acid; Hydrogen Borate; Orthoboric Acid.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-35-3	Boric acid	99.0	233-139-2

Hazard Symbols: None listed.

Risk Phrases: None listed.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. **Caution!** May cause eye and skin irritation. May cause central nervous system effects. May cause respiratory tract irritation. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. Can cause adverse reproductive effects. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

Target Organs: Kidneys, central nervous system, cardiovascular system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be absorbed through damaged or abraded skin in harmful amounts.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness,

coma and possible death due to respiratory failure. May cause tissue anoxia, characterized by weakness, headache, dizziness, confusion, cyanosis (bluish skin due to deficient oxygenation of the blood), weak and irregular heart beat, collapse, unconsciousness, convulsions, coma and death.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic poisoning by boron compounds, borism, may be little more than dry skin and mucous membranes, followed by appearance of a red tongue, patchy alopecia (hair loss), cracked lips, and conjunctivitis. Infants and young children are more susceptible to boric acid poisoning than adults.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Boric acid	none listed	none listed	none listed

OSHA Vacated PELs: Boric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 5.2 (1% sol. at 20C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: 339 deg F
Decomposition Temperature: Not available.
Solubility: 4.9g/100g water at 20C.
Specific Gravity/Density: 1.44 (Water=1)
Molecular Formula: H₃BO₃
Molecular Weight: 61.8292

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: High temperatures, dust generation.
Incompatibilities with Other Materials: Incompatible with acetic anhydride and potassium. Reacts with basic materials to form borate salts.
Hazardous Decomposition Products: Oxides of boron.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10043-35-3: ED4550000; ED4560000
LD50/LC50:
CAS# 10043-35-3:
Oral, mouse: LD50 = 3450 mg/kg;
Oral, rat: LD50 = 2660 mg/kg;
Oral, rat: LD50 = 2500 mg/kg; <BR.

Carcinogenicity:
CAS# 10043-35-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: No information available.
Other Studies: None.

Section 12 - Ecological Information

Ecotoxicity: Water flea Daphnia: LC50 = 115.0-153.0 mg/L; 48 Hr.; Static Condition

Mosquito fish (fresh water) TLM=1800 ppm/24H Mosquito fish (fresh water) TLM=1800 ppm/24H

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-35-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 10043-35-3: acute, chronic.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-35-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 10043-35-3: 1

Canada - DSL/NDSL

CAS# 10043-35-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List

CAS# 10043-35-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 10043-35-3: OEL-RUSSIA: STEL 10 mg/m³

Material Safety Data Sheet

Bromocresol Green

ACC# 60160

Section 1 - Chemical Product and Company Identification

MSDS Name: Bromocresol Green

Catalog Numbers: B383-5

Synonyms: BCG; Bromocresol blue; M-cresol 4,4'-(3H-2,1-benzoxathiol-3-ylidene)bis(2,6-dibromo-s,s-dioxide);

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
76-60-8	Bromocresol green	ca. 100	200-972-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: beige to brown crystalline powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: Dust may cause mechanical irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation. No information regarding skin irritation and other potential effects was found.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: May be harmful if ingested in large amounts.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromocresol green	none listed	none listed	none listed

OSHA Vacated PELs: Bromocresol green: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: beige to brown

Odor: odorless

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate:Not applicable.
Viscosity: Not applicable.
Boiling Point: Not applicable.
Freezing/Melting Point:225 deg C
Decomposition Temperature:225 deg C
Solubility: Slightly soluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:C₂₁H₁₄Br₄O₅S
Molecular Weight:698.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 76-60-8: SJ7456000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 76-60-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 76-60-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 76-60-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 76-60-8: No information available.

Canada - DSL/NDSL

CAS# 76-60-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Bromothymol blue

ACC# 60100

Section 1 - Chemical Product and Company Identification

MSDS Name: Bromothymol blue

Catalog Numbers: AC151360000, AC151360050, AC151360250, AC151361000, AC403250000, AC403250010, AC403250050, AC403250100, AC403250250, B388-10, NC9785507, S71920-2

Synonyms: Bromothymol Blue; Dibromothymolsulfophthalein; 3,3'-Dibromothymolsulfophthalein; Bromothymolblue, Water Soluble; Bromothymol Blue,

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
76-59-5	Bromothymol blue	>97	200-971-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: Allergic reactions have occurred with similar compounds.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromothymol blue	none listed	none listed	none listed

OSHA Vacated PELs: Bromothymol blue: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: light pink - purple - brown

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:204 deg C decomp.
Decomposition Temperature:Not available.
Solubility: Sparingly soluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:C₂₇H₂₇Br₂O₅Na
Molecular Weight:646.0438

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 76-59-5: SJ7450000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 76-59-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 76-59-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 76-59-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 76-59-5: No information available.

Canada - DSL/NDSL

CAS# 76-59-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Bromocresol Purple

ACC# 03333

Section 1 - Chemical Product and Company Identification

MSDS Name: Bromocresol Purple

Catalog Numbers: B393-5

Synonyms: 5',5'-Dibromo-o-cresol sulfophthalein

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
115-40-2	Bromocresol Purple	100	204-087-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: gray, purple, light or pale yellow solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Water or foam may cause frothing.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep away from heat, sparks, and flame. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromocresol Purple	none listed	none listed	none listed

OSHA Vacated PELs: Bromocresol Purple: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: gray, purple, light or pale yellow

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 240 deg C

Decomposition Temperature: 240 deg C

Solubility: < 0.1%

Specific Gravity/Density: Not available.

Molecular Formula: C₂₁H₁₆Br₂O₅S

Molecular Weight: 539.977

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated.

Conditions to Avoid: Incompatible materials, ignition sources, strong oxidants, temperatures above 140°C.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, carbon dioxide, hydrogen bromide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 115-40-2 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 115-40-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 115-40-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 115-40-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 115-40-2: No information available.

Canada - DSL/NDSL

CAS# 115-40-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Bromophenol Blue

ACC# 60130

Section 1 - Chemical Product and Company Identification

MSDS Name: Bromophenol Blue

Catalog Numbers: B392-5, BP115-25

Synonyms: Albutest; Bromphenol Blue; Tetrabromophenolsulfophthalein; 3', 3'', 5', 5''-Tetrabromophenolsulfoththalein

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
115-39-9	Bromphenol blue	ca 100	204-086-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slight orange solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual industrial handling. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling. The toxicological properties of this substance have not been fully investigated.

Chronic: Allergic reactions have occurred with similar compounds.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. No special precautions indicated.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromphenol blue	none listed	none listed	none listed

OSHA Vacated PELs: Bromphenol blue: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: slight orange

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:273 deg C
Decomposition Temperature:279 deg C
Solubility: Sparingly soluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:C19H10Br4O5S
Molecular Weight:669.743

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 115-39-9: SJ7453000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 115-39-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 115-39-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 115-39-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 115-39-9: No information available.

Canada - DSL/NDSL

CAS# 115-39-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Brucine Sulfate Heptahydrate

ACC# 76326

Section 1 - Chemical Product and Company Identification

MSDS Name: Brucine Sulfate Heptahydrate

Catalog Numbers: B391-25, B391I 25, B391I-25, B391I25

Synonyms: 2,3-Dimethoxystrychnidin-10-one Sulfate, Heptahydrate; Strychnidin-10-one, 2,3-Dimethoxy-, Sulfate (1:1), Heptahydrate

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5787-00-8	Brucine Sulfate Heptahydrate	100.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! May be fatal if swallowed. Poison! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause central nervous system effects. May cause blurred vision.

Target Organs: Central nervous system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. Poison by ingestion. May cause tremors and convulsions.

Inhalation: May cause effects similar to those described for ingestion. May cause respiratory tract irritation.

Chronic: Not available.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. SPEED IS ESSENTIAL. A DOCTOR MUST BE NOTIFIED AT ONCE.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Brucine is very similar to strychnine.

Section 5 - Fire Fighting Measures

General Information: Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Remove

contaminated clothing and wash before reuse. Use only in a well-ventilated area. Avoid contact with skin and eyes. Do not ingest or inhale.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Brucine Sulfate Heptahydrate	none listed	none listed	none listed

OSHA Vacated PELs: Brucine Sulfate Heptahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible

Vapor Density: Not available.

Evaporation Rate: Negligible

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Slightly soluble in water

Specific Gravity/Density: Not available.

Molecular Formula: (C₂₃H₂₆N₂O₄)₂H₂SO₄·7H₂O

Molecular Weight: 1012.5514

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: None reported.

Incompatibilities with Other Materials: Oxidizers

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 5787-00-8 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 5787-00-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	BRUCINE	TOXIC SOLID ORGANIC NOS (BRUCINE SULFATE)
Hazard Class:	6.1	6.1
UN Number:	UN1570	UN2811
Packing Group:	I	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5787-00-8 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 5787-00-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5787-00-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 5787-00-8: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

EM SCIENCE -- CX0012, CADMIUM METAL -- 6810-00N031390

=====
===== Product Identification =====

Product ID: CX0012, CADMIUM METAL
MSDS Date: 01/21/1987
FSC: 6810
NIIN: 00N031390
MSDS Number: BPLHT
=== Responsible Party ===
Company Name: EM SCIENCE
Address: 111 WOODCREST RD
City: CHERRY HILL
State: NJ
ZIP: 08034-0395
Country: US
Info Phone Num: 609-354-9200
Emergency Phone Num: 609-354-9200
CAGE: DO242

==== Contractor Identification ====
Company Name: E M SCIENCE DIV OF E M INDUSTRIES INC
Address: 480 DEMOCRAT ROAD
Box: 70
City: GIBBSTOWN
State: NJ
ZIP: 08027
Country: US
Phone: 800-222-0342/609-423-6300
CAGE: 63612
Company Name: EM SCIENCE
Address: 480 DEMOCRAT RD
City: GIBBSTOWN
State: NJ
ZIP: 08927
Phone: 800-424-9300 (CHEMTREC)
CAGE: DO242

=====
===== Composition/Information on Ingredients =====

Inged Name: CADMIUM (SARA III)
CAS: 7440-43-9
RTECS #: EU9800000
OSHA PEL: SEE 1910.1027
ACGIH TLV: 0.01 MG/M3 DUST; 9394
EPA Rpt Qty: 10 LBS
DOT Rpt Qty: 10 LBS

=====
===== Hazards Identification =====

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation: YES Skin: NO Ingestion: YES
Reports of Carcinogenicity: NTP: YES IARC: YES OSHA: NO
Health Hazards Acute and Chronic: ACUTE: INHALATION OF DUST OR FUME CAN
CAUSE SEVERE LUNG IRRITATION AND PULMONARY EDEMA, WHICH MAY BE
FATAL. INGESTION CAUSES SEVERE GASTROINTESTINAL IRRITATION. CONTACT
WITH SKIN OR EYES MAY CAUSE IRRITATION. MEDICAL SURVEILLANCE OF
PERSONNEL CONTINUALLY EXPOSED (EFTS OF OVEREXP)

Explanation of Carcinogenicity:CADMIUM:GROUP 2A (IARC); ANTICIPATED TO BE CARCINOGEN.

Effects of Overexposure:HLTH HAZ:TO CADMIUM DUST OR FUMES IS RECOMMENDED. CHRONIC:TESTS ON LAB ANIMALS INDICATE MATERIAL MAY PRODUCE ADVERSE REPRODUCTIVE EFFECTS. CHRONIC EXPOSURE CAN ALSO CAUSE KIDNEY DAMAGE.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.
SKIN:WASH THOROUGHLY WITH SOAP AND WATER. EYES:IMMEDIATELY FLUSH THOROUGHLY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
INHAL:REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. INGEST:IF CONSCIOUS, INDUCE VOMITING.

=====
===== Fire Fighting Measures =====

Flash Point:NONE
Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:CADMIUM DUST IS A MODERATE FIRE AND EXPLOSION HAZARD.

=====
===== Accidental Release Measures =====

Spill Release Procedures:TAKE UP AND CONTAINERIZE FOR PROPER DISPOSAL.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER CLOSED. STORE IN A COOL AREA AWAY FROM IGNITION SOURCES AND OXIDIZERS. DO NOT BREATHE DUST OR FUMES.
Other Precautions:DO NOT GET IN EYES. AVOID PROLONGED OR REPEATED SKIN CONTACT. DO NOT TAKE INTERNALLY.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR SHOULD BE WORN IN THE ABSENCE OF ADEQUATE VENTILATION.
Ventilation:MATERIAL MUST BE HANDLED OR TRANSFERRED IN AN APPROVED HOOD OR WITH ADEQUATE VENTILATION.
Protective Gloves:NEOPRENE, NATURAL RUBBER, PVC (SUPDAT)
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
PROT GLOVES:OR EQUIVALENT GLOVES SHOULD BE WORN TO PREVENT SKIN CONTACT.

=====
===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:B.P. Text:1413F,767C
Melt/Freeze Pt:M.P/F.P Text:610F,321C

Spec Gravity:8.642 (H2O =1)
Solubility in Water:INSOLUBLE
Appearance and Odor:GRAY POWDER, GRANULES, METALLIC RODS OR PIECES.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
HYDRAZOIC ACID, TE, SE, S, ZN.
Stability Condition to Avoid:DUSTING; CONTACT OF DUST WITH IGNITION SOURCES.
Hazardous Decomposition Products:NONE; FORMS CADMIUM OXIDE AS A COMBUSTION PRODUCT.

===== Disposal Considerations =====

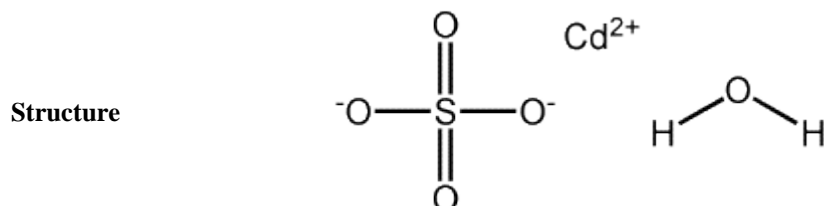
Waste Disposal Methods:TO BE PERFORMED INCOMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

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Cadmium sulfate, hydrate

- Cadmium mesosulfate
- Cadmium sulfate monohydrate
- Sulfuric acid, cadmium salt (1:1), monohydrate

Formula CdSO₄.H₂O



Description White solid.

Uses Used in industries for the electroplating of cadmium in electronic circuits.

Registry Numbers and Inventories.

CAS	13477-20-8
NIH PubChem CID	24962
RTECS	EV2800000
RTECS class	Tumorigen; Reproductive Effector
UN (DOT)	2570
Beilstein/Gmelin	232588 (G)

Properties.

Formula	CdH ₂ O ₅ S
Formula mass	334.60
Density	3.786 g/cm ³
Solubility in water	499 g/L (40 C)

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.

Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	ELIMINATE all ignition sources. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT GET WATER INSIDE CONTAINERS.
Stability	No data.

Fire.

Fire fighting	Extinguish using agent most appropriate for surrounding fire.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Contact with metals may evolve flammable hydrogen gas.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure limit(s)	5 ug/m3 PEL { 2 ug/m3 respirable TLV }
Carcinogen	O, G-A2, I-1, N-1, CP65
Exposure effects	
Ingestion	See Inhalation.
Inhalation	TOXIC; inhalation, ingestion, or skin contact with material may cause severe injury or death. Effects of contact or inhalation may be delayed.
Skin	Contact with molten substance may cause severe burns to skin and eyes. See Inhalation.
Eyes	See Inhalation.
First aid	
Ingestion	Seek medical assistance.
Inhalation	Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.
Skin	Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.
Eyes	Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 2570



Response guide [154](#)

Hazard class 6.1

Packing Group I; II; III

USCG CHRIS Code CDY

Material Safety Data Sheet

Calcium sulfate, anhydrous, 99%

ACC# 97063

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium sulfate, anhydrous, 99%

Catalog Numbers: AC217520000, AC217521000, AC217525000

Synonyms: Crysalba; Drierite; Thiolite

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-18-9	Calcium sulfate, anhydrous	99	231-900-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white powder.

Warning! Causes eye and respiratory tract irritation. May cause skin irritation.

Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause digestive tract disturbances.

Inhalation: Causes respiratory tract irritation. Inhalation of dusts may cause nervous system complaints, ulceration of the mucous membranes of the nose and throat, epistaxis, headache, irritation and nervousness.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium sulfate, anhydrous	10 mg/m ³ TWA (inhalable fraction)	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Calcium sulfate, anhydrous: 15 mg/m³ TWA; 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: colorless to white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 4.69

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 1450 deg C

Decomposition Temperature: Not available.

Solubility: slightly soluble

Specific Gravity/Density: 2.9600g/cm³

Molecular Formula: CaO₄S

Molecular Weight: 136.14

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, moisture, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Oxides of sulfur, oxides of sulfur.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-18-9: WS6920000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7778-18-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-18-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-18-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37 Irritating to eyes and respiratory system.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 7778-18-9: 0

Canada - DSL/NDSL

CAS# 7778-18-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calcium Acetate Monohydrate

ACC# 03845

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Acetate Monohydrate

Catalog Numbers: C46-500, NC9859398

Synonyms: Calcium diacetate; acetic acid calcium salt

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5743-26-0	Calcium acetate, monohydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion

and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium acetate, monohydrate	none listed	none listed	none listed

OSHA Vacated PELs: Calcium acetate, monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 7.6 (0.2M Solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 160 deg C

Decomposition Temperature: 160 deg C

Solubility: 44% at 0°C

Specific Gravity/Density: 1.50 (Water=1)

Molecular Formula:CaC4H6O4.1H2O

Molecular Weight:176.13

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Strong oxidants, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, moisture.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 5743-26-0: AF7875000

LD50/LC50:

CAS# 5743-26-0:

Oral, rat: LD50 = 4280 mg/kg;

Carcinogenicity:

CAS# 5743-26-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. This chemical is expected to have a high biological oxygen demand and may cause oxygen depletion in aquatic systems. It is expected to have a low potential to affect aquatic organisms, and secondary waste treatment microorganisms.

Environmental: No information available.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5743-26-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5743-26-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 5743-26-0: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calcium carbonate

ACC# 03880

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium carbonate

Catalog Numbers: AC124670000, AC124670010, AC124670025, AC219160000, AC219160010, AC219160025, AC219165000, AC403790000, AC403790020, AC403790030, AC403800000, AC403805000, AC403810000, AC403811000, AC403815000, AC423510000, AC423511000, AC423515000, C63-10, C63-3, C64-3, C64-500

Synonyms: Precipitated chalk; Aragonite; Agricultural limestone; Agstone; Bell mine pulverized limestone; Calcite; Dolomite; Franklin; Boiling chips.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
471-34-1	Calcium carbonate	97-100	207-439-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye irritation. May cause skin and respiratory tract irritation.

Target Organs: Eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be

a low ingestion hazard.

Inhalation: Low hazard for usual industrial handling. Excessive inhalation may cause minor respiratory irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium carbonate	none listed	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction) (listed under Calcium carbonate).

OSHA Vacated PELs: Calcium carbonate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 8-9 (solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 825 deg C

Decomposition Temperature: 825 deg C

Solubility: Slightly soluble in water.

Specific Gravity/Density: 2.7-2.9

Molecular Formula: CaCO₃

Molecular Weight: 100.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, aluminum, magnesium, fluorine.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, calcium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 471-34-1: FF9335000

LD50/LC50:

CAS# 471-34-1:

Draize test, rabbit, eye: 750 ug/24H Severe;

Draize test, rabbit, skin: 500 mg/24H Moderate;

Oral, rat: LD50 = 6450 mg/kg;

Carcinogenicity:

CAS# 471-34-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. This chemical is expected to cause no oxygen depletion in aquatic systems. It has a low potential to affect aquatic organisms. Acute aquatic effects: 48-hour LC50; Mosquito fish: 56,000 mg/L.

Environmental: This chemical released into the environment will not have a significant

impact.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 471-34-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 471-34-1: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 471-34-1 can be found on the following state right to know lists: Pennsylvania, (listed as Calcium carbonate), Minnesota, (listed as Calcium carbonate), Massachusetts, (listed as Calcium carbonate).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

WGK (Water Danger/Protection)

CAS# 471-34-1: 0

Canada - DSL/NDSL

CAS# 471-34-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 471-34-1 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Calcium Chloride, Anhydrous Powder, 96%

ACC# 02729

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Chloride, Anhydrous Powder, 96%

Catalog Numbers: AC349610000, AC349610250, AC349615000, NC9297837, XXAC34961-80KG

Synonyms: Calpus; Caltac; Dowflake; Liquidow; Peladow; Snowmelt; Superflake Anhydrous.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-52-4	Calcium Chloride	96%	233-140-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! May be harmful if swallowed. May cause severe respiratory and digestive tract irritation with possible burns. May cause severe eye and skin irritation with possible burns. May cause cardiac disturbances. Hygroscopic (absorbs moisture from the air).

Target Organs: Heart.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause cardiac disturbances. May be harmful if swallowed. In very severe cases, seizures, rapid respiration, slow heartbeat, or death, may

Inhalation: May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Wash clothing before reuse. Always use cool water when dissolving calcium chloride. Heat evolved is significant.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Store below melting point.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium Chloride	none listed	none listed	none listed

OSHA Vacated PELs: Calcium Chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear impervious gloves.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: 8-10 100 g/l aq.sol.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: > 1600 deg C @ 760.0
Freezing/Melting Point:782 deg C
Decomposition Temperature:Not available.
Solubility: 740 g/l water (20°C)
Specific Gravity/Density:Not available.
Molecular Formula:CaCl₂
Molecular Weight:110.99

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Bromine trifluoride, 2-Furanpercarboxylic Acid, Solutions attack some metals..
Hazardous Decomposition Products: Hydrogen chloride, calcium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 10043-52-4: EV9800000
LD50/LC50:
CAS# 10043-52-4:
Oral, mouse: LD50 = 1940 mg/kg;
Oral, rabbit: LD50 = 1384 mg/kg;
Oral, rat: LD50 = 1 gm/kg; <BR.

Carcinogenicity:
CAS# 10043-52-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found.
Teratogenicity: No information found.
Reproductive Effects: No information found.
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-52-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10043-52-4: acute, chronic, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10043-52-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 22 Do not breathe dust.

S 24 Avoid contact with skin.

WGK (Water Danger/Protection)

CAS# 10043-52-4: 0

Canada - DSL/NDSL

CAS# 10043-52-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calcium Hydroxide

ACC# 03980

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Hydroxide

Catalog Numbers: AC219180000, AC219180010, AC219180025, AC219180050, AC219181000, AC219185000, AC385610000, AC385890000, AC403850000, AC403850010, AC403850050, C88-500, C97-10, C97-3, C97-500, C9710LC, C9750

Synonyms: Biocalc; Calcium hydrate; Calcium dihydrate; Carboxide; Calcium dihydroxide; Caustic lime; Hydrated lime; Slaked lime; Kalkhydrate; Lime water; Lime milk

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1305-62-0	Calcium hydroxide	>95	215-137-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless solid.

Danger! Eye contact may result in permanent eye damage. Causes eye burns. Causes severe skin irritation. May cause severe respiratory and digestive tract irritation with possible burns.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury. May cause permanent visual impairment.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. Causes severe pain, nausea, vomiting, diarrhea, and shock. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May cause chemical bronchitis with coughing and difficulty in breathing.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is nonflammable.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium hydroxide	5 mg/m ³ TWA	5 mg/m ³ TWA	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Calcium hydroxide: 5 mg/m³ TWA (not in effect as a result of reconsideration)

Personal Protective Equipment

Eyes: Wear dust-proof goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless

Odor: odorless

pH: 12.4 (sat. sol.)

Vapor Pressure: 0 mm Hg

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: 580 deg C
Decomposition Temperature: Not available.
Solubility: Slightly soluble.
Specific Gravity/Density: 2.24 (Water=1)
Molecular Formula: CaH₂O₂
Molecular Weight: 74.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Readily absorbs carbon dioxide from air forming calcium carbonate.
Conditions to Avoid: High temperatures, dust generation, prolonged exposure to air.
Incompatibilities with Other Materials: Acids, phosphorus, maleic anhydride, nitromethane, nitroethane, nitroparaffins, nitropropane, some metals.
Hazardous Decomposition Products: Calcium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 1305-62-0: EW2800000

LD50/LC50:

CAS# 1305-62-0:

Draize test, rabbit, eye: 10 mg Severe;

Oral, mouse: LD50 = 7300 mg/kg;

Oral, rat: LD50 = 7340 mg/kg;

Carcinogenicity:

CAS# 1305-62-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Mosquito fish, TLm=240 ppm/24H, 220 ppm/48H, 160 ppm/96H at 21-23C.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (Calcium hydroxide)	CORROSIVE SOLID BASIC INORGANIC (CALCIUM HYDROXIDE)
Hazard Class:	8	8
UN Number:	UN3262	UN3262
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1305-62-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1305-62-0: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1305-62-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 41 Risk of serious damage to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

WGK (Water Danger/Protection)

CAS# 1305-62-0: 1

Canada - DSL/NDSL

CAS# 1305-62-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1305-62-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Calcium Hypochlorite

ACC# 88002

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Hypochlorite

Catalog Numbers: AC199030010

Synonyms: Calcium oxychloride; losantin; Hypochlorous acid; Calcium salt; Lime chloride

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-54-3	Calcium hypochlorite	ca.100	231-908-7

Hazard Symbols: O C

Risk Phrases: 22 31 34 8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder. **Danger!** Strong oxidizer. Contact with other material may cause a fire. Corrosive. Causes eye and skin burns. May be harmful if swallowed. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury. May cause blepharitis (inflammation of the margins of the eyelids).

Skin: Causes severe burns with delayed tissue destruction.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes chemical burns to the respiratory tract. Aspiration may lead to

pulmonary edema. May cause systemic effects. Causes corrosive action on the mucous membranes.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with combustible materials may cause a fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Use water with caution and in flooding amounts. Contaminating or mixing with foreign materials such as combustibles, grease, and fuels can cause fire. Containers may explode when heated.

Extinguishing Media: Use water spray to cool fire-exposed containers. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires, flood fire area with water from a distance.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not get water inside containers. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Discard contaminated shoes.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Do not store near combustible materials. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium hypochlorite	none listed	none listed	none listed

OSHA Vacated PELs: Calcium hypochlorite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: strong odor - chlorine-like

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Decomposes

Freezing/Melting Point: 100 deg C

Decomposition Temperature: 175 deg C

Solubility: Slightly soluble.

Specific Gravity/Density: 2.350

Molecular Formula: CaCl₂O₂

Molecular Weight: 142.9848

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, incompatible materials, ignition sources, dust generation, acids, excess heat, combustible materials, organic materials, reducing agents.

Incompatibilities with Other Materials: Reducing agents, carbontetrachloride, ammonia, aliphatic amines, aromatic amines, sulfur, sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), metal oxides, glycerol, phenols, diethylene glycol monomethyl ether, carbon, acetic acid + potassium, cyanides (e.g. potassium cyanide, sodium cyanide), ammonium chloride, charcoal, N,N-dichloromethylamine + heat, ethanol, menthol, iron oxide, rust, 1-propanethiol, isobutanethiol, turpentine, sodium hydrogen sulfate + starch + sodium carbonate, acetylene, hydroxy compounds (e.g. ethanol, ethylene glycol, glycerol, sugar), combustible materials (e.g. anthracene, grease, oil, mercaptans, methyl carbitol, nitromethane, organic matter, and propylmercaptan).

Hazardous Decomposition Products: Hydrogen chloride, irritating and toxic fumes and gases, oxygen, chlorine.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-54-3: NH3485000

LD50/LC50:

CAS# 7778-54-3:

Oral, rat: LD50 = 850 mg/kg; <BR.

Carcinogenicity:

CAS# 7778-54-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.**Teratogenicity:** No information available.**Reproductive Effects:** No information available.**Neurotoxicity:** No information available.**Mutagenicity:** Mutation in Microorganisms: Salmonella typhimurium = 1 mg/plate.;

Cytogenetic Analysis: Hamster, Fibroblast = 4 gm/L.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Fish: Striped bass: LC50 = 0.5 mg/L; 24 Hr; Static bioassay (70% hypochlorite)

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	CALCIUM HYPOCHLORITE, DRY				No information available.
Hazard Class:	5.1				
UN Number:	UN1748				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-54-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 7778-54-3: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7778-54-3: acute, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7778-54-3 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-54-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

O C

Risk Phrases:

R 22 Harmful if swallowed.

R 31 Contact with acids liberates toxic gas.

R 34 Causes burns.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 1/2 Keep locked up and out of reach of children.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 43J In case of fire, use water. Do not use dry chemicals or foams. CO2 or Halon may provide limited control.

WGK (Water Danger/Protection)

CAS# 7778-54-3: 2

Canada - DSL/NDSL

CAS# 7778-54-3 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

**Canadian Ingredient Disclosure List
Exposure Limits**

Material Safety Data Sheet

Calcium nitrate tetrahydrate

ACC# 04020

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium nitrate tetrahydrate

Catalog Numbers: AC217510000, AC217510010, AC423530000, AC423530250, AC423535000, C108-3, C109-3, C109-500, NC9529337

Synonyms: Nitric acid, calcium salt, tetrahydrate; Norwegian saltpeter tetrahydrate; Calcium dinitrate tetrahydrate; Lime nitrate tetrahydrate; Nitrocalcite tetrahydrate; Lime saltpeter tetrahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13477-34-4	Calcium nitrate tetrahydrate	>99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye irritation. May cause skin and respiratory tract irritation. May cause methemoglobinemia. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause digestive tract disturbances. Ingestion of nitrate containing compounds can lead to methemoglobinemia.

Inhalation: May cause respiratory tract irritation. May cause methemoglobinemia. The toxicity of nitrates is due to their in-vivo conversion to nitrites which may lead to methemoglobinemia.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Containers may explode in the heat of a fire. May decompose explosively when heated or involved in a fire. May accelerate burning if involved in a fire.

Extinguishing Media: Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep from contact with clothing and other combustible materials. Avoid breathing dust. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Keep away from reducing agents. Keep containers tightly closed. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium nitrate tetrahydrate	none listed	none listed	none listed
Calcium nitrate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Calcium nitrate tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Calcium nitrate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not applicable.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 45 deg C
Decomposition Temperature: 132 deg C
Solubility: Soluble.
Specific Gravity/Density: 1.82
Molecular Formula: $\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$
Molecular Weight: 236.15

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Deliquescent (tending to absorb atmospheric water vapor and become liquid).
Conditions to Avoid: Mechanical shock, dust generation, moisture, excess heat.
Incompatibilities with Other Materials: Strong reducing agents, ammonia, finely powdered metals, hydrazine, organic materials, combustible materials.
Hazardous Decomposition Products: Oxides of nitrogen, calcium oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 13477-34-4: EW3000000
CAS# 10124-37-5: EW2985000
LD50/LC50:
CAS# 13477-34-4:
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, rat: LD50 = 3900 mg/kg;
.
CAS# 10124-37-5:
Oral, rat: LD50 = 302 mg/kg;
.

Carcinogenicity:

CAS# 13477-34-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 10124-37-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.**Teratogenicity:** No information available.**Reproductive Effects:** No information available.**Mutagenicity:** No information available.**Neurotoxicity:** No information available.**Other Studies:**

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CALCIUM NITRATE	CALCIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1454	UN1454
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13477-34-4 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10124-37-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 13477-34-4: immediate, fire.

CAS # 10124-37-5: immediate, fire.

Section 313

This material contains Calcium nitrate tetrahydrate (listed as Water Dissociable Nitrate Compounds), >99%, (CAS# 13477-34-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

This material contains Calcium nitrate anhydrous (listed as Water Dissociable Nitrate Compounds), -%, (CAS# 10124-37-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 13477-34-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 10124-37-5 can be found on the following state right to know lists: New Jersey.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36 Irritating to eyes.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 13477-34-4: 1

CAS# 10124-37-5: 1

Canada - DSL/NDSL

CAS# 10124-37-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 13477-34-4 is not listed on the Canadian Ingredient Disclosure List.

CAS# 10124-37-5 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Calcium oxalate monohydrate, 98%

ACC# 80705

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium oxalate monohydrate, 98%

Catalog Numbers: AC403880000, AC403880050, AC403885000

Synonyms: Ethanedioic acid; calcium salt, monohydrate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5794-28-5	Calcium oxalate, monohydrate	98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause kidney damage. Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. Oxalate is an irritant and may cause dermatitis. Skin lesions begin with epithelial cracking and the formation of slow-healing ulcers. The fingers may appear cyanotic.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause kidney damage. Mean lethal dose for oxalates in adults is estimated at 10 - 30 grams (143 - 428 mg/kg).

Inhalation: Causes respiratory tract irritation.

Chronic: May cause kidney injury.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Oxalates slowly corrode steel.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calcium oxalate, monohydrate	none listed	none listed	none listed
Ethanedioic acid, calcium salt (1:1)	none listed	none listed	none listed

OSHA Vacated PELs: Calcium oxalate, monohydrate: No OSHA Vacated PELs are listed for this chemical. Ethanedioic acid, calcium salt (1:1): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.
Freezing/Melting Point: 200 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density: 2.2
Molecular Formula: C₂CaO₄H₂O
Molecular Weight: 146.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, calcium oxide, calcium carbonate.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 5794-28-5 unlisted.

CAS# 563-72-4 unlisted.

LD50/LC50:

Not available.

Not available.

The mean lethal dose for an adult is felt to be from 10 to 30 grams (143-428 mg/kg) with death resulting from acute kidney failure within a few hours.

Carcinogenicity:

CAS# 5794-28-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 563-72-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Teratogenicity: No information found

Reproductive Effects: Oxalic acid caused kidney damage in fetal sheep and rats and disturbed the estrus cycle in rats. Increased sperm abnormalities were seen in the second generation of mice administered 0.2% oxalic acid in the drinking water.

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLID ORGANIC NOS (CALCIUM OXALATE MONOHYDRATE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5794-28-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 563-72-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5794-28-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 563-72-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 5794-28-5: No information available.

CAS# 563-72-4: No information available.

Canada - DSL/NDSL

CAS# 563-72-4 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calcium Phosphate Dibasic

ACC# 04063

Section 1 - Chemical Product and Company Identification

MSDS Name: Calcium Phosphate Dibasic

Catalog Numbers: BP441-500, C135-500

Synonyms: Dicalcium Phosphate; Phosphoric Acid Calcium Salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7757-93-9	PHOSPHORIC ACID, CALCIUM SALT	100	231-826-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! Eye contact may result in permanent eye damage. Causes severe eye irritation. May cause severe skin irritation. Causes severe respiratory tract irritation.

Target Organs: Eyes.

Potential Health Effects

Eye: Causes eye irritation. May result in corneal injury.

Skin: Causes skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Dust is irritating to the respiratory tract.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively. Monitor calcium, phosphate, and magnesium levels if large amounts are ingested.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Noncombustible.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
PHOSPHORIC ACID, CALCIUM SALT	none listed	none listed	none listed

OSHA Vacated PELs: PHOSPHORIC ACID, CALCIUM SALT: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 6.0-7.4 @ 25% slurry

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: 350 deg C

Decomposition Temperature:350 deg C

Solubility: 0.075% @ 100°C

Specific Gravity/Density:2.3(2H₂O)

Molecular Formula:CaHPO₄

Molecular Weight:136.0584

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, electrical sparks.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Oxides of phosphorus, irritating and toxic fumes and gases, calcium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7757-93-9 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7757-93-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7757-93-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7757-93-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7757-93-9: 1

Canada - DSL/NDSL

CAS# 7757-93-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Calmagite

ACC# 29623

Section 1 - Chemical Product and Company Identification

MSDS Name: Calmagite

Catalog Numbers: AC108170000, AC108170050, AC108170100, AC108171000, AC9386816, 10817-0250

Synonyms: 3-Hydroxy-4-(2-hydroxy-5-methylphenylazo)-1-naphthalenesulfonic acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
3147-14-6	Calmagite	100	221-563-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black crystalline powder.

Danger! Causes burns by all exposure routes.

Target Organs: Respiratory system, gastrointestinal system, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns. May be harmful if absorbed through the skin.

Ingestion: Causes gastrointestinal tract burns. May be harmful if swallowed.

Inhalation: Causes chemical burns to the respiratory tract. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use foam, dry chemical, or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on

clothing. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Store in a cool, dry place. Store in a tightly closed container. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Calmagite	none listed	none listed	none listed

OSHA Vacated PELs: Calmagite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: black

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 300 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₇H₁₄N₂O₅S

Molecular Weight: 358.38

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 3147-14-6 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 3147-14-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: *Pseudomonas putida*: ; ; No data available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste

regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ARYL SULFONIC ACIDS, SOLID	ARYL SULFONIC ACIDS, SOLID
Hazard Class:	8	8
UN Number:	UN2585	UN2585
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 3147-14-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 3147-14-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

C

Risk Phrases:

R 34 Causes burns.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 3147-14-6: 1

Canada - DSL/NDSL

CAS# 3147-14-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CALUMET LUBRICANTS CO -- CALSOL 810 -- 9150-00N078297

=====
Product Identification
=====

Product ID:CAL SOL 810
MSDS Date:08/01/1991
FSC:9150
NIIN:00N078297
MSDS Number: CGGDJ
=== Responsible Party ===
Company Name:CALUMET LUBRICANTS CO
Address:10234 HWY 157
City:PRINCETON
State:LA
ZIP:71057-9172
Country:US
Info Phone Num:318-949-2421
Emergency Phone Num:318-949-2421
Preparer's Name:J HARRIS III
CAGE:EO350

==== Contractor Identification ===

Company Name:CALUMET LUBRICANTS COMPANY
Address:2780 WATERFRONT PKWY EAST, SUITE 200
City:INDIANAPOLIS
State:IN
ZIP:46214
Country:US
Phone:318-949-2421
CAGE:EO350

=====
Composition/Information on Ingredients
=====

Ingred Name:MINERAL OIL, PETROLEUM DISTILLATES, HYDROTREATED (SEVERE),
HEAVY NAPHTHENIC; (SEVERELY HYDROTREATED HEAVY (ING 2)
CAS:64742-52-5
RTECS #:PY8035001
Fraction by Wt: 100%
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:ING 1: NAPHTHENIC DISTILLATE) OR POSSIBLE BLEND OF
INGREDIENT 1 AND 3
RTECS #:9999999ZZ
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:MINERAL OIL, PETROLEUM DISTILLATES, HYDROTREATED (SEVERE)
LIGHT NAPHTHENIC; (SEVERELY HYDROTREATED LIGHT (ING 4)
CAS:64742-53-6
RTECS #:PY8036001
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:ING 3: NAPHTHENIC DISTILLATE)
RTECS #:9999999ZZ
OSHA PEL:N/K
ACGIH TLV:N/K

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: TESTS ON SIMILAR MATERIALS SHOW
A LOW ORDER OF ACUTE TOXICITY. MAY CAUSE MILD REVERSIBLE EYE AND
SKIN IRRITATION. PROLONGED SKIN EXPOSURE MAY CAUSE DERMATITIS OR
OIL ACNE. BREATHING MISTS MAY CAUSE DIZZINESS OR PULMONARY
IRRITATION.INGESTION MAY CAUSE CRAMPS AND DIARRHEA. CHRONIC:
NON-CARCINOGENIC.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:IN ALL CASES REMOVE SOURCE OF EXPOSURE. INHAL: NOT LIKELY TO
OCCUR EXCEPT AS MIST. REMOVE TO FRESH AIR & CONSULT MD. IF BRTHG IS
DFCLT GIVE OXYGEN. IF NOT BRTHG GIVE ARTF RESP. EYES: FLUSH EYES
IMMED W/WATER FOR AT LST 15 MIN OR UNTIL IRRIT SUBSIDES. IF IRRIT
PERSISTS, CONSULT MD. SKIN: WASH THOROUGHLY W/SOAP & WATER. IF
IRRIT/RASH DEVELOPS, CONSULT MD. INGEST: DO NOT INDUCE VOMIT.
CONSULT MD.

=====
===== Fire Fighting Measures =====

Flash Point Method:PMCC
Flash Point:302F,150C
Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER FOG AND FOAM.
NOTE: WATER, FOG AND FOAM MAY CAUSE FROTHING AND SPATTERING.
Fire Fighting Procedures:USE NIOSH APPROVED SCBA AND FULL PROTECTIVE
EQUIPMENT . USE WATER SPRAY TO COOL CONTAINERS EXPOSED TO FLAMES.
Unusual Fire/Explosion Hazard:PRODUCTS OF COMBUSTION INCLUDE FUMES,
SMOKE AND CARBON MONOXIDE. MATERIAL MAY IGNITE AT OR ABOVE THE
FLASH POINT IF AN IGNITION SOURCE IS PRESENT.

=====
===== Accidental Release Measures =====

Spill Release Procedures:SHUT OFF IGNITION SOURCES. CONTAIN SPILL AND
KEEP FROM ENTERING WATERWAYS OR SEWERS. LARGE QUANTITIES CAN BE
PUMPED. SMALL QUANTITIES MAY BE SOAKED UP ON OIL ABSORBENTS.
CONSULT YOUR SPCC PLAN.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:KEEP AWAY FROM FLAMES, SPARKS OR HOT
SURFACES. NEVER USE A TORCH TO CUT/WELD ON OR NEAR CONTAINER. EMPTY
OIL CONTAINERS CAN CONTAIN EXPLOSIVE VAPORS.
Other Precautions:NEVER WEAR OIL SOAKED CLOTHING. LAUNDRER OR DRY CLEAN
BEFORE WEARING. DISCARD OIL SOAKED SHOES. AFFIX PROPER WARNING
LABELS ON CONTAINERS IN ACCORDANCE WITH 29 CFR 1910.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NORMALLY NOT REQUIRED IF ADEQUATE VENTILATION.
IF EXPOSURE LIMIT IS EXCEEDED, NIOSH APPROVED APPARATUS IS
REQUIRED.

Ventilation:IF MISTS ARE PRESENT, PROVIDE ADEQUATE VENTILATION TO
CONTROL LEVEL BELOW THE PERMISSIBLE EXPOSURE LIMIT.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:OIL RESISTANT (NEOPRENE OR PLASTIC).

Other Protective Equipment:ANSI APPRVD EYE WASH & DELUGE SHOWER . IF
THERE IS A LIKELIHOOD OF OIL SPLASHING, OIL RESISTANT APRON
(SUPDAT)

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

OTHER PROT EQUIP: SHOULD BE WORN TO PREVENT CLOTHING CONTAMINATION.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:>500F,>260C

Melt/Freeze Pt:M.P/F.P Text:-49F,-45C

Vapor Pres:<0.5 @ 20C

Vapor Density:>5

Spec Gravity:0.9

Evaporation Rate & Reference:NEGLIGIBLE

Solubility in Water:NOT SOLUBLE

Appearance and Odor:CLEAR, PALE STRAW TO WATER WHITE LIQUID; MINERAL
OIL ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

STRONG OXIDIZERS. NEVER PERMIT OIL TO GET IN AN OXYGEN REGULATOR.

Stability Condition to Avoid:NOT APPLICABLE.

Hazardous Decomposition Products:CARBON MONOXIDE AND OTHER COMBUSTION
PRODUCTS OF HYDROCARBONS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE ACCORDING TO CURRENT LOCAL, STATE AND
FEDERAL REGULATIONS. MATERIALS MAY BECOME HAZARDOUS WASTE THROUGH
USE. IF PERMITTED, INCINERATION MAY BE PRACTICAL. CONSIDER
RECYCLING.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Canada balsam, neutral, filtered.

ACC# 04145

Section 1 - Chemical Product and Company Identification

MSDS Name: Canada balsam, neutral, filtered.

Catalog Numbers: 61232-1000, B10-100

Synonyms: Fir, balsam.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
8007-47-4	Canada balsam	100	232-362-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to green liquid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Canada balsam	none listed	none listed	none listed

OSHA Vacated PELs: Canada balsam: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: yellow to green

Odor: fresh green odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: > 1

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 0.98

Molecular Formula: Varies

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Oxides of carbon.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 8007-47-4: CP2352500

LD50/LC50:

CAS# 8007-47-4:

Oral, rat: LD50 = >5 gm/kg;

Skin, rabbit: LD50 = >5 gm/kg;

Carcinogenicity:

CAS# 8007-47-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 8007-47-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 8007-47-4: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 8007-47-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 8007-47-4: No information available.

Canada - DSL/NDSL

CAS# 8007-47-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled. .

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

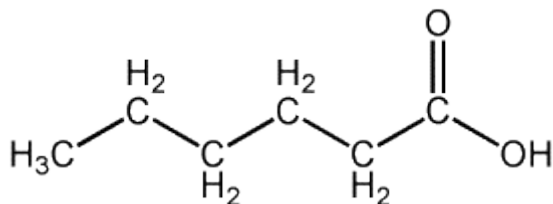
Canadian Ingredient Disclosure List

Hexanoic acid

- Caproic acid
- Butylacetic acid
- Hexylic acid
- Capronic acid
- n-Hexoic acid
- Pentylformic acid

Formula $\text{CH}_3(\text{CH}_2)_4\text{COOH}$

Structure



Description

Oily, colorless or slightly yellow liquid, with a characteristic goat- or limburger cheese-like odor.

Uses

As insect attractant.

Registry Numbers and Inventories.

CAS	142-62-1
NIH PubChem CID	8892
EC (EINECS/ELINCS)	205-550-7
EC Class	C, R: 34-20/21/22, S: 26-36/37/39-45
RTECS	MO5250000
RTECS class	Mutagen; Primary Irritant
UN (DOT)	2829
Merck	13,1765
Beilstein/Gmelin	773837
Beilstein Reference	4-02-00-00917
EPA OPP	128917
FEMA	2559
Swiss Giftliste 1	G-2176
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed

Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	C6H12O2
Formula mass	116.16
Melting point, °C	-4.8
Boiling point, °C	202
Vapor pressure, mm _{Hg}	0.16 (25 C)
Vapor density (air=1)	4.01
Saturation Concentration	Approximately 260 ppm (0.026%) at 25 C (calculated)
Odor threshold	3.0 mg/kg
Critical temperature	387
Critical pressure	31.58
Density	0.9276 g/cm ³ (20 C)
Solubility in water	Very soluble
Viscosity	2.84 cp (25 C)
Surface tension	23.4 g/s ² @ 70 C
Refractive index	1.4165 (15 C)
pKa/pKb	4.78 (pKa)
Partition coefficient, pK _{ow}	1.84
Heat of vaporization	46.6 kJ/mol
Heat of combustion	-3492 kJ/mol

Hazards and Protection.

Storage	Store in a cool, dry place. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
<u>WHMIS</u>	D1B E
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Do not ingest or inhale.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European

Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Small spills/leaks	Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Do not get water inside containers.
Disposal code	4
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Bases, oxidizing agents, reducing agents.
Decomposition	Carbon monoxide, carbon dioxide.

Fire.

Flash Point, °C	102
Autoignition, °C	380
Upper exp. limit, %	8.2
Lower exp. limit, %	1.3
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Extinguishing media: For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.). Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated.
Combustion products	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
NEPA	
Health	3
Flammability	1
Reactivity	0

Health.

Exposure limit(s)	OEL-RUSSIA:STEL 5 mg/m3
Poison_Class	4
Exposure effects	Abnormal neuropsychologic function has been reported following hydrochloric acid exposure from a leaking tanker truck.
Ingestion	Causes gastrointestinal tract burns. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.
Inhalation	Effects may be delayed. Causes chemical burns to the respiratory tract. May be harmful if inhaled.

Skin Harmful if absorbed through the skin. Causes skin burns. Effects of contact may be delayed.

Eyes Causes eye burns.

First aid

Ingestion Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Skin Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

Transportation.

UN number 2829

Response guide [153](#)

Hazard class 8



Packing Group III

USCG CHRIS Code HXO

[USCG Compatibility Group](#) 4 Organic acids

HS Code 2915 90 80

Std. Transport # 4931450

IMO Chemical Code 18

IMO Pollution Category D

Material Safety Data Sheet

Carmine

ACC# 04352

Section 1 - Chemical Product and Company Identification

MSDS Name: Carmine

Catalog Numbers: C579-25

Synonyms: Carmine aluminum lake; CI 75470

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1390-65-4	Carmine	100	215-724-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Not available.

Caution! May cause irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this

substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not available

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Carmine	none listed	none listed	none listed

OSHA Vacated PELs: Carmine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: Not available.

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 138 - 140 deg C

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula:C9H6F2O2

Molecular Weight:184.14

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, aluminum oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1390-65-4: FH8891000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1390-65-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1390-65-4 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1390-65-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 1390-65-4: No information available.

Canada - DSL/NDSL

CAS# 1390-65-4 is listed on Canada's DSL List.

Canada - WHMIS

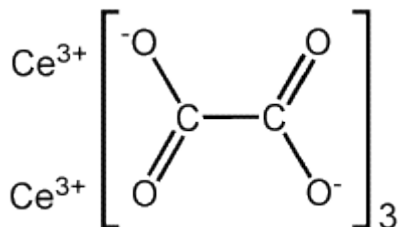
This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Cerium oxalate

- Oxalic acid, cerium salt
- Ethanedioic acid, cerium salt

Formula $\text{Ce}_2\text{C}_6\text{O}_{12}$ **Structure**

Registry Numbers and Inventories.

CAS	7047-99-6
NIH PubChem CID	165565
EC (EINECS/ELINCS)	230-326-0
EC Index Number	607-007-00-3
EC Class	Xn; R21/22
Canada DSL/NDSL	NDSL
US TSCA	Listed
Japan ENCS (MITI)	Listed

Properties.

Formula	$\text{C}_6\text{Ce}_2\text{O}_{12}$
Formula mass	544.29
Melting point, °C	Decomposes
Solubility in water	Slightly soluble

Hazards and Protection.

Storage	Store in a sealed container. Keep away from heat and moisture.
Protection	Always wear approved safety glasses when handling a chemical substance in the laboratory. Wear appropriate chemical resistant gloves and protective clothing.
Respirators	If in form of fine dust and ventilation is not available a respirator should be worn. The use of respirators requires a Respirator Protection Program to be in compliance with 29 CFR 1910.134.
Small spills/leaks	Small spills can be mixed with vermiculite or sodium carbonate and swept up.

Stability	Stable if stored as directed.
Incompatibilities	Oxidizing agents.
Decomposition	Carbon dioxide, carbon monoxide, organic vapors, and metal oxides and carbonates.

Fire.

Fire fighting	Carbon dioxide, dry powder or foam to extinguish. If involved in a fire, fire fighters should be equipped with a NIOSH approved positive pressure self-contained breathing apparatus and full protective clothing.
Combustion products	If involved in a fire this material may emit toxic organic fumes.

Health.

Exposure effects

Ingestion	Ingestion may cause vomiting, pain, violent muscular stimulation, convulsions, collapse, and death.
Inhalation	May be severely irritating to the nose, mucous membranes and respiratory tract.
Skin	May cause moderate to severe irritation of the skin.
Eyes	May cause moderate to severe irritation of the eyes.

First aid

Ingestion	Antidotes are said to be soluble calcium given orally, and calcium gluconate given intravenously, to be administered by trained medical personnel. Keep the victim calm. Give the victim water (only if conscious).
Inhalation	Remove the victim to fresh air. Closely monitor the victim for signs of respiratory problems, such as difficulty in breathing, coughing, wheezing, or pain. In such cases seek immediate medical assistance.
Skin	Wash the affected area with soap and water. Remove contaminated clothes if necessary. Seek medical assistance if irritation persists.
Eyes	Immediately flush the eyes with copious amounts of water for at least 10-15 minutes. A victim may need assistance in keeping their eye lids open. Get immediate medical attention.

Material Safety Data Sheet

Chlorophenol Red

ACC# 72272

Section 1 - Chemical Product and Company Identification

MSDS Name: Chlorophenol Red

Catalog Numbers: AC190040000, AC190040010, AC190040050, AC190040100, AC9532978, AC9655454, AC9681524, NC9596774

Synonyms: CPR; 3'-3'-Dichlorophenylsulfonaphthalein.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
4430-20-0	Chlorophenol Red	99+	224-619-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark reddish brown crystalline powder.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chlorophenol Red	none listed	none listed	none listed

OSHA Vacated PELs: Chlorophenol Red: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: brown - dark reddish brown

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 14.6

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 261 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₉H₁₂Cl₂O₅S

Molecular Weight: 423.26

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 4430-20-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 4430-20-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		(8)
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 4430-20-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 4430-20-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 4430-20-0: 1

Canada - DSL/NDSL

CAS# 4430-20-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 4430-20-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Chloramine-T trihydrate

ACC# 45371

Section 1 - Chemical Product and Company Identification

MSDS Name: Chloramine-T trihydrate

Catalog Numbers: AC227850000, AC227850250, AC227852500, 22785-0010, NES6100-250, O1779-250

Synonyms: N-Chloro-p-toluenesulfonamide, sodium salt; Tosylchloramide sodium.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7080-50-4	Chloramine-T trihydrate	98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white crystalline powder.

Danger! Causes burns by all exposure routes. Harmful if swallowed. May cause allergic respiratory reaction. Contact with acids liberates toxic gas.

Target Organs: Central nervous system, respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns. May be harmful if absorbed through the skin. NIOSHTIC 1997: A case of occupational allergic contact urticaria from chloramine-T solution in a 48 yr old hospital bath attendant was described. The authors conclude that she suffers from

occupational allergic contact urticaria caused by chloramine-T. Merck MSDS issued in May 2004 says rabbit skin tests resulted in burns.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns.

Inhalation: May cause allergic respiratory reaction. Causes chemical burns to the respiratory tract. May be harmful if inhaled.

Chronic: Laboratory experiments have resulted in mutagenic effects. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals. Exposure to high concentrations may cause central nervous system depression.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 192 deg C (377.60 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood. Acids should not be used around this material unless absolutely necessary and then only after careful planning. Contact with acids liberates toxic gas.

Storage: Store in a cool, dry place. Store in a tightly closed container. Corrosives area. Keep away from acids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chloramine-T trihydrate	none listed	none listed	none listed
Chloramine-T anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Chloramine-T trihydrate: No OSHA Vacated PELs are listed for this chemical. Chloramine-T anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white to off-white

Odor: chlorine-like

pH: 8 - 10 (5% aq.sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 170 - 177 deg C (decom)
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: C7H7CINNaO2S.3H2O
Molecular Weight: 281.69

Section 10 - Stability and Reactivity

Chemical Stability: Contact with acid liberates gas. Air sensitive.
Conditions to Avoid: Incompatible materials, exposure to air, excess heat, temperatures above 130°C.
Incompatibilities with Other Materials: Strong oxidizing agents, acids.
Hazardous Decomposition Products: Hydrogen chloride, chlorine, carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7080-50-4 unlisted.
CAS# 127-65-1: XT5616800
LD50/LC50:
Not available.
Not available.

Carcinogenicity:
CAS# 7080-50-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 127-65-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.
Hazard Class:	8	8
UN Number:	UN3263	UN3263
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7080-50-4 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 127-65-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 127-65-1: immediate, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7080-50-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 127-65-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 22 Harmful if swallowed.

R 31 Contact with acids liberates toxic gas.

R 34 Causes burns.

R 42 May cause sensitization by inhalation.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 7 Keep container tightly closed.

WGK (Water Danger/Protection)

CAS# 7080-50-4: No information available.

CAS# 127-65-1: 2

Canada - DSL/NDSL

CAS# 127-65-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 127-65-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Chloroacetic Acid

ACC# 04690

Section 1 - Chemical Product and Company Identification

MSDS Name: Chloroacetic Acid

Catalog Numbers: A176 500, A176-500, A176500

Synonyms: Chloroethanoic Acid; Monochloroacetic Acid; Momochloroethanoic Acid

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
79-11-8	CHLOROACETIC ACID	>98	201-178-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless or white solid.

Danger! Corrosive. Causes eye and skin burns. Causes digestive and respiratory tract burns. May be harmful if swallowed. May cause central nervous system effects. May cause lung damage. May cause liver and kidney damage.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: May cause irreversible eye injury. Contact with liquid is corrosive to the eyes and causes severe burns.

Skin: Contact with liquid is corrosive and causes severe burns and ulceration.

Ingestion: May cause perforation of the digestive tract. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause corrosion and

permanent tissue destruction of the esophagus and digestive tract. May be harmful if swallowed.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause liver and kidney damage. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause pulmonary edema and severe respiratory disturbances. May cause kidney damage.

Chronic: May cause liver and kidney damage.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Chloroacetic acid causes competitive inhibition of acetate oxidation and acetylates sulfhydryl residues in the liver and kidney.

Section 5 - Fire Fighting Measures

General Information: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. Combustible material; may burn but does not ignite readily.

Extinguishing Media: Water or foam may cause frothing. Use water spray to cool fire-exposed containers. Do NOT get water inside containers. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: 126 deg C (258.80 deg F)

Autoignition Temperature: 470 deg C (878.00 deg F)

Explosion Limits, Lower:8.0.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not get water inside containers. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Discard contaminated shoes.
Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from metals. Keep away from reducing agents. Do not store in metal containers. Do not store near alkaline substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
CHLOROACETIC ACID	none listed	none listed	none listed

OSHA Vacated PELs: CHLOROACETIC ACID: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: colorless or white
Odor: acetic odor
pH: 1.93 (0.1M)
Vapor Pressure: .75 mm Hg @ 20C
Vapor Density: 3.2 (air=1)
Evaporation Rate:1 (butyl acetate=1)
Viscosity: 2.16 cp@70C
Boiling Point: 189 deg C
Freezing/Melting Point:62 deg C
Decomposition Temperature:Not available.
Solubility: Soluble in water.
Specific Gravity/Density:1.404 (water=1)
Molecular Formula:C₂H₃ClO₂
Molecular Weight:94.4728

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Incompatible materials, ignition sources, dust generation, moisture, metals, excess heat.
Incompatibilities with Other Materials: Strong oxidizers, amines, alcohols, reducing agents, metals, and alkali.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 79-11-8: AF8575000
LD50/LC50:
CAS# 79-11-8:
Inhalation, rat: LC50 = 180 mg/m³;
Oral, rat: LD50 = 55 mg/kg;

Carcinogenicity:

CAS# 79-11-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: This chemical has shown mutagenic effects in laboratory animals.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. 96-hr LC50; fathead minnow: GT100 mg/L 96-Hr LC50; water flea: 80 mg/L

Environmental: Plant germination effects: No adverse effects at: Ryegrass 10 mg/L Radish 10 mg/L Lettuce 10 mg/L Plant seedling effects: No adverse effects at: Nargold 10 mg/L Radish 10 mg/L Lettuce 10 mg/L Corn 100 mg/L

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CHLOROACETIC ACID, SOLID	CHLOROACETIC ACID SOLID
Hazard Class:	6.1	6.1(8)
UN Number:	UN1751	UN1751
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 79-11-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 79-11-8: 1 lb statutory RQ; 0.454 kg statutory RQ; 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 79-11-8: 100 lb TPQ (lower threshold); 10000 lb TPO (upper threshold)

SARA Codes

CAS # 79-11-8: immediate, delayed.

Section 313

This material contains CHLOROACETIC ACID (CAS# 79-11-8, >98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 79-11-8 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 79-11-8 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 25 Toxic if swallowed.

R 34 Causes burns.

R 50 Very toxic to aquatic organisms.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 79-11-8: 2

Canada - DSL/NDSL

CAS# 79-11-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 79-11-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cholesterol

ACC# 04915

Section 1 - Chemical Product and Company Identification

MSDS Name: Cholesterol

Catalog Numbers: BP946-100, BP946-500, C314-500

Synonyms: (3.beta.)-cholest-5-en-3-ol

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
57-88-5	CHOLESTEROL	100	200-353-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with skin and eyes. Avoid ingestion

and inhalation.

Storage: Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
CHOLESTEROL	none listed	none listed	none listed

OSHA Vacated PELs: CHOLESTEROL: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: practically odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 360 deg C

Freezing/Melting Point: 148.9 deg C

Decomposition Temperature: 360 deg C

Solubility: 0.2% in water.

Specific Gravity/Density: 1.067

Molecular Formula: C₂₇H₄₄OH

Molecular Weight: 385.3144

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 57-88-5: FZ8400000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 57-88-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CARBON DIOXIDE, SOLID USED FOR DIAGNOSTIC OR TREATMENT PURPOSE	No information available.
Hazard Class:	9	
UN Number:		
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 57-88-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 57-88-5: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 57-88-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 57-88-5: 1

Canada - DSL/NDSL

CAS# 57-88-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled. .

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

SIGMA CHEMICAL COMPANY -- C4384 CHONDROITIN SULFATE C SODIUM FROM SHARK CARTILAGE -- 6550-00F054215

=====
Product Identification
=====

Product ID:C4384 CHONDROITIN SULFATE C SODIUM FROM SHARK CARTILAGE
MSDS Date:05/19/1997
FSC:6550
NIIN:00F054215
MSDS Number: CFGSR
=== Responsible Party ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178-5000
Country:US
Info Phone Num:314-771-5765/800-325-3010
Emergency Phone Num:314-771-5765/800-325-3010
CAGE:21076

==== Contractor Identification ====

Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
Composition/Information on Ingredients
=====

Ingred Name:CHONDROITIN, 6-(HYDROGEN SULFATE), SODIUM SALT
CAS:12678-07-8

=====
Hazards Identification
=====

LD50 LC50 Mixture:ORAL LD50(RAT): >10 GM/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:MAY BE HARMFUL BY INHALATION,
INGESTION/SKIN ABSORPTION. MAY CAUSE IRRITATION.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION.

=====
First Aid Measures
=====

First Aid:INGESTION: WASH OUT MOUTH W/WATER IF CONSCIOUS. SKIN: FLUSH
W/COPIOUS AMOUNTS OF WATER FOR 15 MINS. INHALATION: REMOVE TO FRESH
AIR. EYES: FLUSH W/COPIOUS AMOUNTS OF WATER FOR 15 MINS. OBTAIN
MEDICAL ATTENTION IN ALL CASES.

=====
Fire Fighting Measures
=====

Extinguishing Media:WATER SPRAY, CO2, DRY CHEMICAL POWDER/APPROPRIATE

FOAM.

Fire Fighting Procedures:WEAR SCBA & PROTECTIVE CLOTHING.

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR PROTECTIVE EQUIPMENT. SWEEP UP, PLACE IN A BAG & HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA & WASH SITE AFTER MATERIAL PICKUP IS COMPLETE.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.

Ventilation:MECHANICAL EXHAUST REQUIRED.

Protective Gloves:CHEMICAL RESISTANT

Eye Protection:SAFETY GOGGLES

Other Protective Equipment:PROTECTIVE CLOTHING.

Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING & SHOES BEFORE REUSE.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

Solubility in Water:COMPLETE

Appearance and Odor:SOLID

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

Hazardous Decomposition Products:COMBUSTION: CO, CO2, NITROGEN OXIDES, SULFUR OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:DISSOLVE/MIX W/A COMBUSTIBLE SOLVENT & BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER, IAW/FEDERAL, STATE & LOCAL REGULATIONS.

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Material Safety Data Sheet

Chromium (III) oxide

ACC# 05060

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium (III) oxide

Catalog Numbers: AC192080000, AC192085000, AC353580000, C333-3, C334-500, NC9526419, NC9527292, NC9609821, S79968, XXC33410KG

Synonyms: Chromic Sesquioxide; chrome green; chrome oxide; chromium sesquioxide; chromium (3+) trioxide; dichromium trioxide

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1308-38-9	Chromium (III) oxide	99-100.0	215-160-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light to dark green powder.

Warning! May cause allergic skin reaction. May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May cause an allergic reaction in certain individuals.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation. Chromium (III) oxide is poorly absorbed

into the body and, therefore, exists mostly as a "nuisance" dust.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. Repeated inhalation may cause chronic bronchitis. A review of studies conducted over 100 years showed no conclusive evidence for a cancer hazard among workers exposed to aerosols formed by chromium metal or Chromium (III) compounds. The International Agency for Research on Cancer (IARC) has concluded that there is inadequate evidence in humans or experimental animals for the carcinogenicity of Chromium (III) compounds. The overall evaluation concluded that Chromium (III) compounds are not classifiable as to their carcinogenicity to humans.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Noncombustible.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromium (III) oxide	none listed	none listed	none listed

OSHA Vacated PELs: Chromium (III) oxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: light to dark green

Odor: odorless

pH: 7.5@ 0.5% soln.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate:Not available.

Viscosity: Not applicable.

Boiling Point: 4000 deg C

Freezing/Melting Point:2435 deg C

Decomposition Temperature:Not available.

Solubility: insoluble in water.

Specific Gravity/Density:5.21 (water=1)

Molecular Formula:Cr₂O₃

Molecular Weight:151.9902

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Alkaline earth metals, chlorine trifluoride, oxygen difluoride, lithium, rubidium, rubidium acetylide, glycerol.

Hazardous Decomposition Products: Not known.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1308-38-9: GB6475000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1308-38-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: A review of studies conducted over 100 years showed no conclusive evidence for a cancer hazard among workers exposed to aerosols formed by chromium metal or Chromium (III) compounds. The International Agency for Research on Cancer (IARC) has concluded that there is inadequate evidence in humans or experimental animals for the carcinogenicity of Chromium (III) compounds. The overall evaluation concluded that Chromium (III) compounds are not classifiable as to their carcinogenicity to humans.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1308-38-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1308-38-9: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1308-38-9 can be found on the following state right to know lists: New Jersey, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 1308-38-9: 1

Canada - DSL/NDSL

CAS# 1308-38-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1308-38-9 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Chromium potassium sulfate dodecahydrate, p.a.

ACC# 01269

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium potassium sulfate dodecahydrate, p.a.

Catalog Numbers: AC222520000, AC222520050, AC222521000, AC222525000

Synonyms: Chromium (III) Potassium sulfate, dodecadrate; Chromic Alum (Dodecahydrate); Potassium Chromium Alum Dodecahydrate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7788-99-0	Chromium (III) Potassium Sulfate Dodecahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple - grey.

Warning! Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction.

Target Organs: Lungs.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: No hazard expected in normal industrial use.

Inhalation: Dust is irritating to the respiratory tract. Causes irritation of mucous membrane.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromium (III) Potassium Sulfate Dodecahydrate	none listed	none listed	none listed

OSHA Vacated PELs: Chromium (III) Potassium Sulfate Dodecahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: purple - grey

Odor: None reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 400 deg C

Freezing/Melting Point: 88.9 deg C

Decomposition Temperature: Not available.

Solubility: 19.6 % in water

Specific Gravity/Density: 1.8

Molecular Formula: CrKSS2O8.12H2O

Molecular Weight: 556.9495

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, heat.

Hazardous Decomposition Products: Oxides of sulfur, chromium fumes.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7788-99-0: GB6850000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7788-99-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Mutation data reported.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7788-99-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7788-99-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7788-99-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 7788-99-0: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7788-99-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Chromium (III) Sulfate Hydrate

ACC# 04970

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium (III) Sulfate Hydrate

Catalog Numbers: C338-500

Synonyms: Chromic sulfate; dichromium sulfate; sulfuric acid chromium salt

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10101-53-8	Chromium (III) Sulfate Hydrate	100%	233-253-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green to violet to red solid.

Warning! Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Causes respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with skin and eyes.

Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation.
Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromium (III) Sulfate Hydrate	none listed	none listed	none listed

OSHA Vacated PELs: Chromium (III) Sulfate Hydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green to violet to red

Odor: odorless

pH: 1.0-2.5 5% solution

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 1.7-3.0

Molecular Formula: Cr₂(SO₄)₃.nH₂O

Molecular Weight: 392.1648

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: None reported.

Incompatibilities with Other Materials: Hydrogen gas may be evolved from moist chromic sulfate. If damp material is sealed for a prolonged period of time, the container may rupture because of the pressure of hydrogen. Reacts violently with reducing agents, combustibles, ammonia, halides, phosphorous, sodium azide, elemental sulfur and urea.

Hazardous Decomposition Products: Oxides of sulfur, oxides of sulfur.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10101-53-8: GB7200000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10101-53-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10101-53-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10101-53-8: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10101-53-8: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10101-53-8 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10101-53-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 10101-53-8: 1

Canada - DSL/NDSL

CAS# 10101-53-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10101-53-8 is listed on the Canadian Ingredient Disclosure List.

SUPELCO INC -- CHROMOSORB PAW-DMCS 80/100, 20207 -- 6810-00N059180

=====
Product Identification
=====

Product ID:CHROMOSORB PAW-DMCS 80/100, 20207

MSDS Date:10/25/1989

FSC:6810

NIIN:00N059180

MSDS Number: BXGNH

=== Responsible Party ===

Company Name:SUPELCO INC

Address:SUPELCO PARK

City:BELLEFONTE

State:PA

ZIP:16823-0048

Country:US

Info Phone Num:814-359-3441

Emergency Phone Num:814-359-3441

CAGE:54968

=== Contractor Identification ===

Company Name:SIGMA-ALDRICH INC.

Address:3050 SPRUCE STREET

Box:14508

City:ST. LOUIS

State:MO

ZIP:63103

Country:US

Phone:314-771-5765/414-273-3850X5996

CAGE:54968

=====
Composition/Information on Ingredients
=====

Ingred Name:DIATOMACEOUS EARTH, FLUX-CALCINED; (SILICA, AMORPHOUS
DIATOMACEOUS EARTH)

CAS:68855-54-9

Fraction by Wt: 90%

OSHA PEL:6 MG/M3

ACGIH TLV:10 MG/M3

Ingred Name:SILICA, CRYSTALLINE - CRISTOBALITE

CAS:14464-46-1

RTECS #:VV7325000

Fraction by Wt: 10%

OSHA PEL:0.05 MG/M3 (MFR)

ACGIH TLV:0.05 MG/M3 RDUST

=====
Hazards Identification
=====

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO

Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO

Health Hazards Acute and Chronic:DUST MAY CAUSE RESPIRATORY INJURY IF
INHALED. OVEREXPOSURE TO AMORPHOUS SILICA DUSTS OVER PROTRACTED
PERIODS MAY RESULT IN PNEUMOCONIOSIS WHEREAS CRYSTALLINE SILICAS
CONTRIBUTE TO SILICOSIS.

Explanation of Carcinogenicity:SILICA, CRYSTALLINE-CRISTOBALITE:IARC
MONOGRAPHS, SUPP, VOL 7, PG 341, 1987:GRP 2A. NTP 7TH ANNUAL RPT ON
(SUPP DATA)

Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INGEST:CALL MD IMMEDIATELY . EYES:FLUSH W/WATER FOR AT LEAST
15 MINUTES. SKIN:FLUSH W/LARGE VOLUMES OF WATER. INHAL:IMMEDIATELY
MOVE TO FRESH AIR.

=====
===== Fire Fighting Measures =====

Extinguishing Media:THIS MATERIAL IS NOT FLAMMABLE. EXTINGUISHING MEDIA
DETERMINED BY SUPPORTING FIRE.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT .

=====
===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP MATERIAL. AVOID GENERATING DUST.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:AVOID GENERATING DUST.
Other Precautions:THIS MATL IS INTENDED FOR R&D USE ONLY & MAY NOT BE
USED FOR DRUG, HOUSEHOLD OR OTHER PURPOSES. THIS MATL SHOULD BE
HANDLED ONLY BY QUALIFIED PERSONS TRAINED IN LAB PROCEDURES & GOOD
SAFETY PRACTICES.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED RESPIRATORY PROTECTION.
NIOSH/MSHA APPROVED RESPIRATOR FOR PNEUMOCONIOSIS PRODUCING DUST.
Ventilation:USE ONLY IN WELL VENTILATED AREA.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .
Other Protective Equipment:NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
EXPLAN OF CARCIN:CARCINOGENS, 1994:ANTICIPATED TO BE CARCINOGEN.

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:4226F,2330C
Melt/Freeze Pt:M.P/F.P Text:3110F,1710C
Vapor Pres:0
Vapor Density:0
Spec Gravity:2.3 (H*20=1)
Evaporation Rate & Reference:0
Solubility in Water:0%
Appearance and Odor:PINK SOLID; ODORLESS.
Percent Volatiles by Volume:0

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG BASES, HYDROFLUORIC ACID.

===== Disposal Considerations =====

Waste Disposal Methods:COMPLY W/ALL APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS.

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Material Safety Data Sheet

Cobalt oxide

ACC# 05294

Section 1 - Chemical Product and Company Identification

MSDS Name: Cobalt oxide

Catalog Numbers: AC206220000, AC206220250, AC206220500, S75093, C382-500, NC9004072, XXC3825KG

Synonyms: Cobaltic-cobaltous oxide; Cobaltous oxide; Tricobalt tetraoxide; Cobalt oxide Co₃O₄; Cobalt (II,III) oxide; Cobalto-cobaltic oxide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1308-06-1	Cobalt oxide Co ₃ O ₄	100	215-157-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black-gray crystalline powder.

Warning! May cause allergic skin reaction. May cause eye, skin, and respiratory tract irritation. May be harmful if swallowed. May cause cancer based on animal studies.

Hygroscopic (absorbs moisture from the air). This product contains cobalt(II) oxide, a chemical known to the state of California to cause cancer.

Target Organs: Lungs, skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which

becomes evident upon re-exposure to this material.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May cause chronic airway hyperreactivity and asthma, with changes in pulmonary function.

Chronic: Cobalt compounds may cause cancer based upon animal studies. May cause chronic heart disease due to effects on the heart muscle.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical aid if symptoms occur. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cobalt oxide Co ₃ O ₄	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed
Cobalt(II) oxide	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed

OSHA Vacated PELs: Cobalt oxide Co₃O₄: No OSHA Vacated PELs are listed for this chemical. Cobalt(II) oxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: black-gray

Odor: Not available.
pH: Not available.
Vapor Pressure: Not applicable.
Vapor Density: Not applicable.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 895 deg C
Decomposition Temperature: 895 deg C
Solubility: insoluble
Specific Gravity/Density: 6.11 g /cm³
Molecular Formula: O₄Co₃
Molecular Weight: 240.80

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: No information found..

Hazardous Decomposition Products: Cobalt/cobalt oxides.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 1308-06-1: GG2500000

CAS# 1307-96-6: GG2800000

LD50/LC50:

CAS# 1308-06-1:

Oral, rat: LD50 = >5 gm/kg;

CAS# 1307-96-6:

Oral, rat: LD50 = 202 mg/kg;

Oral, rat: LD50 = 202 mg/kg;

Carcinogenicity:

CAS# 1308-06-1:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.

- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

CAS# 1307-96-6:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** carcinogen, initial date 7/1/92
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: See entry in the Documentation of the Threshold Limit Values and Biological Exposure Indices issued by ACGIH.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Cobalt uptake and phytotoxicity are affected by soil pH. More acidic soils absorb cobalt less strongly.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1308-06-1 is listed on the TSCA inventory.

CAS# 1307-96-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1308-06-1: immediate, delayed.

Section 313

This material contains Cobalt oxide Co₃O₄ (listed as Cobalt compounds), 100%, (CAS# 1308-06-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Cobalt(II) oxide (listed as Cobalt compounds), -%, (CAS# 1307-96-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 1308-06-1 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

CAS# 1307-96-6 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1308-06-1 can be found on the following state right to know lists: New Jersey,

(listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

CAS# 1307-96-6 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

California Prop 65

WARNING: This product contains Cobalt(II) oxide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.

R 43 May cause sensitization by skin contact.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 24 Avoid contact with skin.

S 37 Wear suitable gloves.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 1308-06-1: 0

CAS# 1307-96-6: 2

Canada - DSL/NDSL

CAS# 1308-06-1 is listed on Canada's DSL List.

CAS# 1307-96-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1308-06-1 is not listed on the Canadian Ingredient Disclosure List.

CAS# 1307-96-6 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cobalt(II) Chloride Hexahydrate

ACC# 05345

Section 1 - Chemical Product and Company Identification

MSDS Name: Cobalt(II) Chloride Hexahydrate

Catalog Numbers: AC192090000, AC192090010, AC192091000, AC192092500, AC192860000, AC192860250, AC423570000, AC423570050, S71930, S72893, S75089, S93179, 42357-1000, 42357-5000, C371-100, C371-500, C371500LC

Synonyms: Cobaltous chloride hexahydrate; Cobalt muriate hexahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7791-13-1	Cobalt(II) chloride hexahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple solid.

Warning! Causes irritation and possible burns by all routes of exposure. Possible cancer hazard. May cause cancer based on animal data. May cause allergic respiratory and skin reaction. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May be harmful if swallowed. May cause blood abnormalities. May cause lung damage. May cause adverse reproductive effects. Dangerous for the environment.

Target Organs: Lungs, cardiovascular system, red blood cells, skin, male reproductive system.

Potential Health Effects

Eye: Causes eye irritation and possible burns.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Causes skin irritation and possible burns.

Ingestion: May interfere with blood clotting. May cause thyroid abnormalities. Causes digestive tract irritation with possible burns.

Inhalation: Causes delayed lung injury. May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause asthma and shortness of breath. Causes respiratory tract irritation with possible burns.

Chronic: Cobalt compounds may cause cancer based upon animal studies. Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Noncombustible.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cobalt(II) chloride hexahydrate	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed
Cobalt dichloride anhydrous	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed

OSHA Vacated PELs: Cobalt(II) chloride hexahydrate: No OSHA Vacated PELs are listed for this chemical. Cobalt dichloride anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: purple
Odor: none reported
pH: 4.6 @ M solution.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 1048.9 deg C
Freezing/Melting Point: 87 deg C
Decomposition Temperature: 110 deg C
Solubility: 77 g/100ml (0 C)
Specific Gravity/Density: 1.924
Molecular Formula: CoCl₂·6H₂O
Molecular Weight: 237.9196

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Strong oxidizers and alkali metals. Absorbs NH₃ from air.

Hazardous Decomposition Products: Hydrogen chloride, cobalt/cobalt oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7791-13-1: GG0200000

CAS# 7646-79-9: GF9800000

LD50/LC50:

CAS# 7791-13-1:

Oral, rat: LD50 = 766 mg/kg;

Skin, rat: LD50 = >2 gm/kg;

CAS# 7646-79-9:

Oral, mouse: LD50 = 80 mg/kg;

Oral, rat: LD50 = 80 mg/kg;

Oral, rat: LD50 = 418 mg/kg;

Reproductive hazard: Mouse: Oral Dose: 182 mg/kg (13 Weeks, Male) Paternal effects: Testes, epididymis, sperm duct.

Carcinogenicity:

CAS# 7791-13-1:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

CAS# 7646-79-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O. (COBALTOUS CHLORIDE)	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O. (COBALTOUS CHLORIDE)
Hazard Class:	8	8
UN Number:	UN3260	UN3260
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7791-13-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7646-79-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7791-13-1: immediate, delayed.

CAS # 7646-79-9: immediate, delayed.

Section 313

This material contains Cobalt(II) chloride hexahydrate (listed as Cobalt, inorganic compounds), 100%, (CAS# 7791-13-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Cobalt dichloride anhydrous (listed as Cobalt, inorganic compounds), -%, (CAS# 7646-79-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7791-13-1 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

CAS# 7646-79-9 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7791-13-1 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

CAS# 7646-79-9 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 22 Harmful if swallowed.

R 42/43 May cause sensitization by inhalation and skin contact.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7791-13-1: 2

CAS# 7646-79-9: 2

Canada - DSL/NDSL

CAS# 7646-79-9 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7791-13-1 is not listed on the Canadian Ingredient Disclosure List.

CAS# 7646-79-9 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Congo Red

ACC# 60200

Section 1 - Chemical Product and Company Identification

MSDS Name: Congo Red

Catalog Numbers: AC110500000, AC110500010, AC110501000, AC110502500, AC110505000, AC229620000, AC229620050, AC229620250, AC405360000, AC405360250, S70401, S704011, S71402, C580-25

Synonyms: C.I. Direct Red 28; Atlantic Congo Red; C.I. 22120; Diacotton Congo Red; Benzo Congo Red.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
573-58-0	C.I. Direct Red 28	100	209-358-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark red-brown solid.

Warning! Flammable solid. Causes eye irritation. May cause skin and respiratory tract irritation. Possible risk of harm to the unborn child. May cause cancer in humans. May cause central nervous system effects.

Target Organs: Central nervous system, bladder.

Potential Health Effects

Eye: Causes eye irritation. May cause lacrimation (tearing), blurred vision, and photophobia. May cause chemical conjunctivitis and corneal damage.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause skin irritation and possible burns.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause nausea, vomiting, abdominal pain, and increased salivation.

Inhalation: May cause respiratory tract irritation. Olfactory fatigue may occur. Can produce delayed pulmonary edema.

Chronic: This product is a chemical derivative of benzidine, a known human carcinogen. This substance has caused adverse reproductive and fetal effects in laboratory animals. The primary target organs for carcinogenicity induced by benzidine vary with species. Rats, mice, and hamsters develop liver and mammary tumors. Dogs and humans develop increased incidences of urinary bladder cancer.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. Flammable solid. May burn rapidly with flare burning effect. May re-ignite after fire is extinguished.

Extinguishing Media: Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
C.I. Direct Red 28	none listed	none listed	none listed

OSHA Vacated PELs: C.I. Direct Red 28: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark red-brown

Odor: odorless

pH: 8-9.5 (aq soln)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: > 360 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₃₂H₂₂N₆O₆S₂Na₂

Molecular Weight: 696.67

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Materials containing similar functional groups can decompose at elevated temperatures.

Conditions to Avoid: Incompatible materials, ignition sources, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 573-58-0: QK1400000

LD50/LC50:

CAS# 573-58-0:

Draize test, rabbit, eye: 100 mg Moderate;

Oral, rat: LD50 = 15200 mg/kg;

Carcinogenicity:

CAS# 573-58-0:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 10/1/92 (listed as Benzidine based dyes).
- **NTP:** Known carcinogen (listed as Benzidine based dyes).
- **IARC:** Group 2A carcinogen (listed as Benzidine based dyes).

Epidemiology: A strong association relating human exposure to benzidine based dyes with the subsequent development of bladder tumors was presented after a case-control mortality study of 200 bladder cancer patients in Japan. Patients were mostly kimono painters/dyers

Teratogenicity: C.I. Direct Black 38, a benzidine-based dye, was evaluated for developmental toxicity. All dose levels caused a significant increase in the average % of malformed fetuses. Malformed centra were significantly increased at 200 mg/kg/day and above.

Reproductive Effects: In mice and rats, prenatal exposure to the dye Congo red, a benzidine-based dye, permanently reduces the number of germ cells in male and female offspring. In 1 study, the administration of benzidine to pregnant mice produced liver tumors in the offspring. Oral doses of benzidine-based dyes to pregnant mice on Day 8-12 of gestation altered testicular development & caused hypospermatogenesis during adulthood

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	FLAMMABLE SOLIDS, ORGANIC, N.O.S.	FLAMMABLE SOLIDS, ORGANIC, N.O.S.
Hazard Class:	4.1	4.1

UN Number:	UN1325	UN1325
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 573-58-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 573-58-0: Section 5

TSCA Significant New Use Rule

CAS# 573-58-0: This product is for research and development use only. It is subject to a SNUR which has specific requirements and restrictions. The specific citation for this product is 4040 CFR 721.1660.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 573-58-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 573-58-0 can be found on the following state right to know lists: California, (listed as Benzidine based dyes), New Jersey, Minnesota, (listed as Benzidine based dyes).

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains C.I. Direct Red 28, listed as 'Benzidine based dyes', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T F

Risk Phrases:

- R 11 Highly flammable.
- R 45 May cause cancer.
- R 63 Possible risk of harm to the unborn child.

Safety Phrases:

- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S 53 Avoid exposure - obtain special instructions before use.
- S 7 Keep container tightly closed.
- S 431 In case of fire, use dry chemical, CO₂, water spray or foam. (These chemicals have very low flashpoints and the use of water spray may be inefficient).

WGK (Water Danger/Protection)

CAS# 573-58-0: 1

Canada - DSL/NDSL

CAS# 573-58-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 573-58-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Copper (II) Sulfate Anhydrous

ACC# 05670

Section 1 - Chemical Product and Company Identification

MSDS Name: Copper (II) Sulfate Anhydrous

Catalog Numbers: S93223, S93224, S93225, C495-500

Synonyms: Copper monosulfate; Cupric sulfate; Cupric sulfate anhydrous; Sulfuric acid, copper(2+) salt (1:1).

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7758-98-7	Copper(II) sulfate	>97	231-847-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light gray powder.

Warning! Harmful if swallowed. Causes eye and skin irritation and possible burns. Causes digestive and respiratory tract irritation with possible burns. Hygroscopic (absorbs moisture from the air). Severe marine pollutant.

Target Organs: Blood, kidneys, liver.

Potential Health Effects

Eye: Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities. Causes eye irritation and possible burns.

Skin: Causes skin irritation and possible burns.

Ingestion: Harmful if swallowed. May cause severe gastrointestinal tract irritation with

nausea, vomiting and possible burns. Ingestion of large amounts of copper salts may cause bloody stools and vomit, low blood pressure, jaundice and coma. Ingestion of copper compounds may produce systemic toxic effects to the kidney and liver and central nervous excitation followed by depression.

Inhalation: May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Causes respiratory tract irritation with possible burns.

Chronic: May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Individuals with Wilson's disease are unable to metabolize copper. Thus, copper accumulates in various tissues and may result in liver, kidney, and brain damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic copper poisoning in man is recognized in the form of Wilson's disease.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Individuals with Wilson's disease are more susceptible to chronic copper poisoning.

Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. U.S. regulations require reporting spills and releases to soil, water and air in excess of reportable quantities.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Copper(II) sulfate	none listed	1 mg/m ³ TWA (as Cu, except Copper fume) (listed under Copper compounds, n.o.s.).	none listed

OSHA Vacated PELs: Copper(II) sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and

ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: light gray

Odor: Odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not applicable.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 200 deg C

Decomposition Temperature: 560 deg C

Solubility: Soluble.

Specific Gravity/Density: 3.6

Molecular Formula: CuO₄S

Molecular Weight: 159.61

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Aqueous solution of copper(2+) sulfate is an acid. Incompatible with strong bases, hydroxylamine, magnesium..

Hazardous Decomposition Products: Oxides of sulfur, copper fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7758-98-7: GL8800000

LD50/LC50:

CAS# 7758-98-7:

Oral, mouse: LD50 = 369 mg/kg;

Oral, mouse: LD50 = 87 mg/kg;

Oral, rat: LD50 = 300 mg/kg;

Oral, rat: LD50 = 960 mg/kg;

Carcinogenicity:

CAS# 7758-98-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: See actual entry in RTECS for complete information.

Reproductive Effects: See actual entry in RTECS for complete information.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.1-2.5 mg/L; 96 Hr; UnspecifiedFish: Bluegill/Sunfish: LC50 = 0.6 mg/L; 48 Hr; 15 mg/L CaCO₃Fish: Bluegill/Sunfish: LC50 = 8.0 mg/L; 48 Hr; 68 mg/L CaCO₃Fish: Bluegill/Sunfish: LC50 = 10.0 mg/L; 48 Hr; 100 mg/L CaCO₃Fish: Bluegill/Sunfish: LC50 = 45.0 mg/L; 48 Hr; 132 mg/L CaCO₃ In soil, copper sulfate is partly washed down to lower levels, partly bound by soil components, and partly oxidatively transformed. Copper has a strong affinity for hydrous iron and manganese oxides, clays, carbonate minerals, and organic matter. Sorption to these materials ... suspended in the water column & in the bed sediments, results in relative enrichment of the solid phase and reduction in dissolved levels.

Environmental: Copper is accumulated by plants and animals, but it does not appear to biomagnify from plants to animals. This lack of biomagnification appears common with heavy metals. In air, copper aerosols (in general) have a residence time of 2 to 10 days in an unpolluted atmosphere and 0.1 to > 4 days in polluted, urban areas.

Physical: No evidence was found to indicate that there is any biotransformation process for copper compounds which would have a significant bearing on the fate of copper in aquatic environments.

Other: Has fungicidal properties.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	ENVIRONMENTALLY HAZARDOUS
Hazard Class:	9	9
UN Number:	UN3077	UN3077
Packing Group:	III	III
Additional Info:		SUBSTANCES, SOLID, N.O.S.

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-98-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7758-98-7: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7758-98-7: immediate.

Section 313

This material contains Copper(II) sulfate (listed as Copper compounds, n.o.s.), >97%, (CAS# 7758-98-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7758-98-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

CAS# 7758-98-7 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7758-98-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7758-98-7: 2

Canada - DSL/NDSL

CAS# 7758-98-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7758-98-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Serotonin Creatinine Sulfate Monohydrate, 99%

ACC# 19973

Section 1 - Chemical Product and Company Identification

MSDS Name: Serotonin Creatinine Sulfate Monohydrate, 99%

Catalog Numbers: AC132680000, AC132680010, AC132680050

Synonyms: 5-Hydroxytryptamine Creatinine Sulfate Monohydrate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
61-47-2	Serotonin Creatinine Sulfate Monohydrate	99%	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slightly beige crystalline powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Keep refrigerated. (Store below 4°C/39°F.)

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Serotonin Creatinine Sulfate Monohydrate	none listed	none listed	none listed

OSHA Vacated PELs: Serotonin Creatinine Sulfate Monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: slightly beige

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 216.00 - 219.00 deg C

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.
Molecular Formula: C₁₄H₁₉N₅O₂.H₂SO₄.H₂O
Molecular Weight: 405.42

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide, nitrogen gas, sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 61-47-2 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 61-47-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 61-47-2 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the

CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 61-47-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 61-47-2: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

p-Cresol

ACC# 17610

Section 1 - Chemical Product and Company Identification

MSDS Name: p-Cresol

Catalog Numbers: AC110590000, AC110590050, AC110591000, AC110595000, AC405740000, AC405740040 AC405740040, AC405740050, AC405741000, AC405745000

Synonyms: 4-Cresol; p-Cresylic Acid; 1-Hydroxy-4-Methylbenzene; p-Hydroxytoluene; 4-Hydroxytoluene; p-Methylphenol.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
106-44-5	p-Cresol	>98	203-398-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to light yellow solid. Flash Point: 86.1 deg C.

Danger! Toxic. Causes eye and skin burns. Causes digestive and respiratory tract burns. May be fatal if inhaled. May cause allergic skin reaction. Harmful if swallowed or absorbed through the skin. May cause liver and kidney damage. Light sensitive. Material is a solid at room temperature that melts upon moderate heating into a combustible liquid with a flash point below 200°F(93.3°C). Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, central nervous system, liver, respiratory system.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury. Contact with liquid is corrosive to the eyes and causes severe burns. May cause conjunctivitis and keratitis.

Skin: May be absorbed through the skin in harmful amounts. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Causes severe skin irritation and burns. Initial contact may cause prickling and intense burning.

Affected tissue may initially show white discoloration, wrinkling, and softening, which subsequently may become gangrenous.

Ingestion: May cause severe and permanent damage to the digestive tract. May cause vascular collapse and damage. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause kidney, liver and spleen damage. Rapidly absorbed from the gastrointestinal tract. Cresols may cause abnormalities of the central nervous system, respiratory system, spleen and pancreas.

Inhalation: May be fatal if inhaled. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause liver and kidney damage. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. Causes chemical burns to the respiratory tract. May cause headache. May cause nausea and possible vomiting. Exposure to vapors or aerosols produced by high temperature processes may cause systemic absorption. If sufficient amounts are absorbed vascular collapse, shock, hypothermia, unconsciousness and respiratory failure are possible.

Chronic: May cause liver and kidney damage. Repeated exposure may cause sensitization dermatitis. May cause appetite loss, diarrhea, skin abnormalities, and digestive tract disturbances.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May polymerize explosively when involved in a fire. Material is a solid at room temperature that melts upon moderate heating into a combustible liquid with a flash point below 200°F(93.3°C).

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray.

Flash Point: 86.1 deg C (186.98 deg F)

Autoignition Temperature: 558.9 deg C (1,038.02 deg F)

Explosion Limits, Lower:1.1% @ 150C

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. Provide ventilation. Evacuate unnecessary personnel.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Ground and bond containers when transferring material. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from sources of ignition. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. If the water content is below approximately 0.3% and the temperature exceeds 268°F (120°C), violent corrosion of aluminum and its alloys may occur.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
p-Cresol	5 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	2.3 ppm TWA; 10 mg/m ³ TWA 250 ppm IDLH	5 ppm TWA; 22 mg/m ³ TWA (listed under Cresol).

OSHA Vacated PELs: p-Cresol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to light yellow

Odor: phenol-like

pH: Not available.

Vapor Pressure: 1 mm Hg @ 53 deg C

Vapor Density: 3.72 (air=1)

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 202.2 deg C

Freezing/Melting Point: 35 deg C

Decomposition Temperature: Not available.

Solubility: 22.6g/L @ 40C.

Specific Gravity/Density: 1.03 (water=1)

Molecular Formula: C₇H₈O

Molecular Weight: 108.0554

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Low melting point solid.

Conditions to Avoid: Incompatible materials, light, ignition sources, excess heat.

Incompatibilities with Other Materials: Oxidizing agents, strong acids, bases, active metals, coatings, nitric acid, plastics, rubber, aliphatic amines, amides, chlorosulfonic acid,

oleum, alkalis.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, cresol.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 106-44-5: GO6475000

LD50/LC50:

CAS# 106-44-5:

Draize test, rabbit, eye: 103 mg Severe;
Draize test, rabbit, skin: 517 mg/24H Severe;
Inhalation, rat: LC50 = >710 mg/m³/1H;
Inhalation, rat: LC50 = 29 mg/m³;
Oral, mouse: LD50 = 344 mg/kg;
Oral, mouse: LD50 = 160 mg/kg;
Oral, rabbit: LD50 = 620 mg/kg;
Oral, rat: LD50 = 207 mg/kg;
Oral, rat: LD50 = 270 mg/kg;
Skin, rabbit: LD50 = 301 mg/kg;
Skin, rabbit: LD50 = 301 mg/kg;
Skin, rat: LD50 = 750 mg/kg;
Skin, rat: LD50 = 750 mg/kg;

Carcinogenicity:

CAS# 106-44-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information available.

Reproductive Effects: No information found

Mutagenicity: No information available.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 19-28.6 mg/L; 96 Hr.; UnspecifiedFish: LC50 = 19-28.6 mg/L; 96 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 1.6 mg/L; 15 Minutes; Microtox test Goldfish (soft water) TLm=49.1-19ppm/24-96H Bluegill (soft water) TLm=22.2-20.8ppm/24-96H Fathead minnow (hard water) TLm=18-13.4ppm/24-96H Guppy (hard water) TLm=18-50ppm/24-96H

Environmental: In air, substance will react with photochemically-produced hydroxyl radicals (day) and nitrate radicals (night). In water, substance will biodegrade within days. Substance is mobile in most soils and will biodegrade.

Physical: No information available.

Other: Please refer to the Handbook of Environmental Fate and Exposure Data (Vol 1) for additional information.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CRESOLS, SOLID	CRESOLS, SOLID
Hazard Class:	6.1	6.1(8)
UN Number:	UN3455	UN3455
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 106-44-5 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 106-44-5: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 106-44-5: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 106-44-5: immediate, fire.

Section 313

This material contains p-Cresol (CAS# 106-44-5, >98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 106-44-5 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 106-44-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 106-44-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Cresol), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T C

Risk Phrases:

R 34 Causes burns.

R 24/25 Toxic in contact with skin and if swallowed.

Safety Phrases:

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 106-44-5: 2

Canada - DSL/NDSL

CAS# 106-44-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, D1A, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 106-44-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cresol Red, indicator grade

ACC# 83307

Section 1 - Chemical Product and Company Identification

MSDS Name: Cresol Red, indicator grade

Catalog Numbers: AC151380000, AC151380050, AC151380250

Synonyms:

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1733-12-6	Cresol Red	100	217-064-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-brown powder.

Caution! The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: No information regarding eye irritation and other potential effects was found.

Skin: No information regarding skin irritation and other potential effects was found.

Ingestion: The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Chronic: Not available.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cresol Red	none listed	none listed	none listed

OSHA Vacated PELs: Cresol Red: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: red-brown

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 290 deg C (dec.)

Decomposition Temperature: 290 deg C

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: C₂₁H₁₈O₅S

Molecular Weight: 382.42

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1733-12-6 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1733-12-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1733-12-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1733-12-6: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1733-12-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1733-12-6: 1

Canada - DSL/NDSL

CAS# 1733-12-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Crystal Violet

ACC# 91237

Section 1 - Chemical Product and Company Identification

MSDS Name: Crystal Violet

Catalog Numbers: 66761-5GGSS, 66761S

Synonyms: Crystal violet; Gentian Violet

Company Identification:

Fisher Diagnostics
Fisher Scientific Company, LLC
8365 Valley Pike
Middletown, VA 22645-0307

For information, call: 800-524-0294

Emergency Number: 800-524-0294

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-56-1	Methanol	<100.0	200-659-6
548-62-9	Crystal Violet	2.0	208-953-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple liquid. Flash Point: 52 deg F.

Danger! Poison! **Flammable liquid and vapor.** May be fatal or cause blindness if swallowed. Harmful if inhaled. May be harmful if absorbed through the skin. May cause eye and skin irritation. May cause respiratory tract irritation. May cause central nervous system depression. Eye contact may result in permanent eye damage. May cause liver and kidney damage. May cause fetal effects based upon animal studies. Cannot be made non-poisonous.

Target Organs: Kidneys, central nervous system, liver, eyes.

Potential Health Effects

Eye: Causes moderate eye irritation. Vapors may cause eye irritation. May cause painful

sensitization to light. This product contains a cationic dye. Similar dyes have caused permanent injury to the cornea and conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation. May be absorbed through the skin in harmful amounts.

Ingestion: May cause irritation of the digestive tract. May cause respiratory failure. May cause vascular collapse and damage. May cause kidney failure.

Inhalation: May cause respiratory tract irritation. May cause visual impairment and possible permanent blindness. May cause effects similar to those described for ingestion.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Effects may be delayed. Ethanol may inhibit methanol metabolism.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective.

Flash Point: 52e deg F (11.11 deg C)

Autoignition Temperature: 876 deg F (468.89 deg C)

Explosion Limits, Lower:6.0%

Upper: 36.0%

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Scoop up with a nonsparking tool, then place into a suitable container for disposal. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not get on skin or in eyes. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methanol	200 ppm TWA; 250 ppm STEL; skin - potential for cutaneous absorption	200 ppm TWA; 260 mg/m ³ TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m ³ TWA
Crystal Violet	none listed	none listed	none listed

OSHA Vacated PELs: Methanol: 200 ppm TWA; 260 mg/m³ TWA Crystal Violet: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: purple

Odor: alcohol-like

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 1.1

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 147 deg C

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 0.8

Molecular Formula: Mixture

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, incompatible materials, ignition sources.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, formaldehyde, chloride fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 67-56-1: PC1400000

CAS# 548-62-9: BO9000000

LD50/LC50:

CAS# 67-56-1:

Draize test, rabbit, eye: 40 mg Moderate;

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, rabbit: LC50 = 81000 mg/m³/14H;
Inhalation, rat: LC50 = 64000 ppm/4H;
Oral, mouse: LD50 = 7300 mg/kg;
Oral, rabbit: LD50 = 14200 mg/kg;
Oral, rat: LD50 = 5600 mg/kg;
Skin, rabbit: LD50 = 15800 mg/kg; <BR.

CAS# 548-62-9:

Oral, mouse: LD50 = 96 mg/kg;
Oral, rabbit: LD50 = 150 mg/kg;
Oral, rat: LD50 = 420 mg/kg; <BR.

Carcinogenicity:

CAS# 67-56-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 548-62-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: The toxicological properties have not been fully investigated.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 67-56-1: waste number U154 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	No information available.	No information available.
Hazard Class:		
UN Number:		

Packing Group:		
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Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 67-56-1 is listed on the TSCA inventory.

CAS# 548-62-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 67-56-1: acute, flammable. CAS # 548-62-9: acute.

Section 313

This material contains Methanol (CAS# 67-56-1, 100 0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 67-56-1 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 548-62-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 11 Highly flammable.

R 23/25 Toxic by inhalation and if swallowed.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 2 Keep out of reach of children.

S 24 Avoid contact with skin.

S 7 Keep container tightly closed.

WGK (Water Danger/Protection)

CAS# 67-56-1: 1

CAS# 548-62-9: 2

Canada - DSL/NDSL

CAS# 67-56-1 is listed on Canada's DSL List.

CAS# 548-62-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D1B.

Canadian Ingredient Disclosure List

CAS# 67-56-1 is listed on the Canadian Ingredient Disclosure List.

CAS# 548-62-9 is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- CUPRIC ACETATE -- 6810-00-270-3219

=====
Product Identification
=====

Product ID:CUPRIC ACETATE
MSDS Date:01/01/1987
FSC:6810
NIIN:00-270-3219
MSDS Number: BDRNZ
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Emergency Phone Num:201-726-7100
CAGE:94480
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC COMPANY
Address:52 FADEM ROAD.DOMESTIC DIVISION
City:SPRINGFIELD
State:NJ
ZIP:07081
Country:US
Phone:201-796-7100
CAGE:94480

=====
Composition/Information on Ingredients
=====

Ingred Name:CUPRIC ACETATE CAS# 6046-93-1
CAS:6046-93-1
RTECS #:AG3500000
Fraction by Wt: 100%
ACGIH TLV:1MG(CU)/CUM

=====
Hazards Identification
=====

Effects of Overexposure:INHAL:IRRIT.RESP TRACT,HDCH,ULCER OR
PERFORATION OF NASAL SEPTUM.SKIN:IRRIT,PAIN.SEE OTHER PRECAUT.

=====
First Aid Measures
=====

First Aid:INHAL:REMOVE TO FRESH AIR.GIVE OXYG.KEEP QUIET & WARM.CALL
MD.SKIN:REMOVE CONTAM CLOTHING & SHOES.WASH W/SOAP & WATER FOR 20
MIN.CALL MD.EYE:WASH FOR 20 MIN.CALL MD.INGEST:IF CONSCIOUS & NO
CONVULSION S,GIVE 2-4 GLASS OF WATER.INDUCE VOMIT.CALL MD.

=====
Fire Fighting Measures
=====

Extinguishing Media:DRY CHEM,CO*2,WATER SPRAY OR FOAM
Fire Fighting Procedures:IF POSS,MOVE FROM FIRE AREA.USE SCBA W/FULL
FACE PIECE.
Unusual Fire/Explosion Hazard:FOR LG FIRE:USE WATER SPRAY,FOG OR
ALCOHOL FOAM.DO NOT SCATTER SPILL W/EXCESS WATER.SEE SUPP DATA.

=====
Accidental Release Measures
=====

Spill Release Procedures:SOIL:DIG PIT TO CONTAIN SPILL.DIKE SURFACE
FLOW W/SOIL,SANDBAGS,FOAMED POLYURETHANE OR CONCRETE.ABSORB LIQ
W/FLY ASH OR CEMENT POWDER.WATER:NEUTRALIZE TO PH7.ADD
CA(OCL)*2.OCCUPATIONL:KEEP AWAY FROM F LAME & IGNIT SOURCES.KEEP

AWAY FROM SEWERS.

=====
===== Handling and Storage =====

Handling and Storage Precautions:RESPIR PROTECT:@ 1MG(CU)/CUM,USE
SCBA,FUME PARTICULATE OR SUPPLIED-AIR RESPIR.@ 5MG(CU)/CUM,ALSO USE
FULL FACE-PIECE.SEE SUPP DATA.

Other Precautions:EFFECT OF OVEREXPO:EYE:REDNESS,CONJUNCTIVITIS,EDEMA
OF LIDS & CORNEAL ULCER.INGEST:BURN IN ESOPHAGUS,VOMIT,WATERY OR
BLOODY DIARR,KIDNEY & LIVER DAMAGE,HEMOLYSIS,COLLAPSE & CONVULSION.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH/MSHA APPRVD EQUIPMENT (SEE OTHER PREC)
Ventilation:LOCAL EXHAUST OR GENERAL DILUTION SYSTEM.

Protective Gloves:RUBBER(PER MFR)

Eye Protection:SPLASH/DUST RESIST GOG

Other Protective Equipment:WEAR PROTECT CLOTHING & FACESHIELD.EYE WASH
FOUNTAIN.

Supplemental Safety and Health

MSDS PREP:85155.BP:240C DECOMP.FIRE HAZ:DIKE FIRE CONTROL WATER FOR
LATER DISPOSAL.RESPIR PROTECT:@ >100MG(CU)/CUM,USE POWDERED AIR
PURIFYING OR TYPE C SUPPLIED-AIR RESPIR.

=====
===== Physical/Chemical Properties =====

HCC:N1

Boiling Pt:B.P. Text:464F DECOMP

Spec Gravity:1.9

Solubility in Water:7.2%

Appearance and Odor:GREEN-BLUE PWDR OR SM CRYSTALS.ACETIC ACID ODOR.

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

Hazardous Decomposition Products:ACETONE,ACRID SMOKE & IRRIT FUMES

=====
===== Disposal Considerations =====

Waste Disposal Methods:SWEEP UP & PLACE IN FIBERBOARD CONTAINERS.USE
DREDGE OR LIFT TO EXTRACT IMMOBILIZED MASSES.DISPOSE IN ACCORDANCE
W/LOCAL,STATE & FEDERAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Cupric Nitrate Trihydrate

ACC# 05645

Section 1 - Chemical Product and Company Identification

MSDS Name: Cupric Nitrate Trihydrate

Catalog Numbers: S73208, S73211-1, S93221

Synonyms: Copper(II) nitrate trihydrate; Nitric acid, copper salt, trihydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10031-43-3	Cupric nitrate trihydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: blue solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May be harmful if swallowed. Causes severe respiratory tract irritation. May cause severe eye and skin irritation with possible burns. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. May cause liver and kidney damage. May cause dermatitis.

Target Organs: Kidneys, liver.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. Contact may cause ulceration of the conjunctiva and cornea.

Skin: May cause severe irritation and possible burns. May cause dermatitis. May cause skin

discoloration.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause liver and kidney damage. May cause hemorrhaging of the digestive tract.

Inhalation: May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause liver and kidney damage. Individuals with Wilson's disease are unable to metabolize copper. Thus, copper accumulates in various tissues and may result in liver, kidney, and brain damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Contents may develop pressure upon prolonged storage. Keep away from heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Do not ingest or inhale.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cupric nitrate trihydrate	none listed	1 mg/m ³ TWA (as Cu, except Copper fume) (listed under Copper compounds, n.o.s.).	none listed
Cupric nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Cupric nitrate trihydrate: No OSHA Vacated PELs are listed for this chemical. Cupric nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: blue
Odor: odorless
pH: 4.0 for 0.2M soln.
Vapor Pressure: Not applicable.
Vapor Density: 8.33
Evaporation Rate: Not applicable.
Viscosity: Not available.
Boiling Point: Not applicable.
Freezing/Melting Point: 114.4 deg C
Decomposition Temperature: Not available.
Solubility: Soluble in water.
Specific Gravity/Density: 2.05
Molecular Formula: $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$
Molecular Weight: 241.60

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Incompatible materials, combustible materials, reducing agents, organic matter.
Incompatibilities with Other Materials: Reducing agents, combustible materials, potassium ferrocyanide, ether, tin. Ignites paper spontaneously in the presence of moisture.
Hazardous Decomposition Products: Oxides of nitrogen, irritating and toxic fumes and gases, copper fumes.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10031-43-3: GL7875000
CAS# 3251-23-8: QU7400000
LD50/LC50:
CAS# 10031-43-3:

Oral, rat: LD50 = 940 mg/kg;

CAS# 3251-23-8:

Draize test, rabbit, eye: 100 mg Severe;

Draize test, rabbit, skin: 500 mg Severe;

Oral, mouse: LD50 = 430 mg/kg;

Oral, rat: LD50 = 794 mg/kg;

Oral, rat: LD50 = 940 mg/kg;

Carcinogenicity:

CAS# 10031-43-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 3251-23-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NITRATES, INORGANIC, N.O.S.	NITRATES ORGANIC NOS (CUPRIC NITRATE)
Hazard Class:	5.1	5.1
UN Number:	UN1477	UN1477

Packing Group:	II	II
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Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10031-43-3 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 3251-23-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 3251-23-8: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10031-43-3: immediate, delayed, fire.

CAS # 3251-23-8: immediate, delayed, fire.

Section 313

This material contains Cupric nitrate trihydrate (listed as Copper compounds, n.o.s.), 100%, (CAS# 10031-43-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Cupric nitrate (listed as Water Dissociable Nitrate Compounds), - %, (CAS# 3251-23-8) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 3251-23-8 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

CAS# 10031-43-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10031-43-3 can be found on the following state right to know lists: California, (listed as Copper compounds, n.o.s.), New Jersey, (listed as Copper compounds, n.o.s.), Pennsylvania, (listed as Copper compounds, n.o.s.).

CAS# 3251-23-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 10031-43-3: 2

CAS# 3251-23-8: No information available.

Canada - DSL/NDSL

CAS# 3251-23-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10031-43-3 (listed as Copper compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 3251-23-8 is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- CUPRIC OXIDE -- 6810-00-300-6193

=====
===== Product Identification =====

Product ID:CUPRIC OXIDE
MSDS Date:04/11/1991
FSC:6810
NIIN:00-300-6193
MSDS Number: BSYH
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:COPPER OXIDE (CUPRIC OXIDE)
CAS:1317-38-0
RTECS #:GL7900000
Fraction by Wt: 100%
OSHA PEL:1 MG/M3 FUME (CU)
ACGIH TLV:1 MG/M3 FUME (CU)

Ingred Name:SUPP DATA:HAS RSLTD IN IRRIT, NECROSIS, & GREENISH SKIN
DISCOLORATION. ALLERGIC CNTCT DERM, ALTHOUGH RARE, HAS (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:BEEN REPORTED. EYE:ACUTE:CNTCT MAY CAUSE IRRIT. SOME
COPPER SALTS HAVE BEEN REPORTED TO CAUSE CONJUNC, (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:CORNEAL ULCERATIONS, & TURBIDITY POSS W/PALPEBRAL
EDEMA. COPPER PARTICLES EMBEDDED IN EYE MAY RESULT IN (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4: A PRONOUNCED FOREIGN-BODY RESPONSE W/CHRACTERISTIC
DISCOLORATION OF OCULAR TISSUE. CHRONIC: RPTD/PRLNGD (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:EXPOSURE TO IRRITANTS MAY CAUSE CONJUCTIVITIS.
INGEST: ACUTE:INGEST OF COPPER SALTS MAY CAUSE AN IMMED (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:METALLIC TASTE, SALIVATION, NAUSEA, EPIGASTRIC
BURNING, VOMITING, DIARRHEA, ULCERS, HEMORRHAGIC GASTRITIS, (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7: ANURIA, COMA, CONVULSIONS AND DEATH. CHRONIC:
REPEATED OR PROLONGED EXPOSURE TO COPPER SALTS HAS PRODUCED(ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8:HEMOLYTIC ANEMIA AND LIVER, KIDNEY, AND SPLEEN DAMAGE
IN ANIMALS.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: WATER OR NORMAL SALINE SOLN FOR AT LEAST 15
MIN, OCCASIONALLY LIFTING UPPER & LOWER LIDS, UNTIL (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10: NO EVIDENCE OF CHEMICAL REMAINS (APPROX 15-20 MIN).
GET MED ATTN IMMED. INGEST: DILUTE POIS IMMED W/LRG (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11: AMTS OF WATER OR MILK AND REMOVE BY GASTRIC LAVAGE
UNLESS THE VICTIM IS ALREADY VOMITING. (DREISBACH, (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 12:HANDBOOK OF POISONING, 12TH ED).GET MED ATTN IMMED.
ADMIN OF GASTRIC LAVAGE SHLD BE PERFORMED BY QUALIFIED(ING14)
RTECS #:9999999ZZ

Ingred Name:ING 13: MEDICAL PERSONNEL. ANTIDOTE: THE FOLLOWING ANTIDOTE
HAS BEEN RECOMMENDED. HOWEVER, THE DECISION AS TO (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14: WHETHER THE SEVERITY OF POISONING REQUIRES
ADMINISTRATION OF ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHLD (ING
16)
RTECS #:9999999ZZ

Ingred Name:ING 15:BE MADE BY QUALIFIED MED PERSONNEL. COPPER POIS:
GIVE CALCIUM DISODIUM EDETATE 15-25 MG/KG (0.08-0.125 ML(ING 17)
RTECS #:9999999ZZ

Ingred Name:ING 16:20% SOLN PER KG BODY WT) IN 250-500 ML 5% DEXTROSE
INTRAVENOUSLY OVER A 1-2 HR PERIOD TWICE DAILY. MAX (ING 18)
RTECS #:9999999ZZ

Ingred Name:ING 17: DOSE SHOULD NOT EXCEED 50 MG/KG/DAY, DRUG SHOULD BE
GIVEN IN 5-DAY COURSES W/A REST PERIOD OF @ LST 2 (ING 19)
RTECS #:9999999ZZ

Ingred Name:ING 18:DAYS BETWEEN COURSES. AFTER THE FIRST COURSE,
SUBSEQUENT COURSES SHLD NOT EXCEED 50 MG/KG/DAY. DAILY (ING 20)
RTECS #:9999999ZZ

Ingred Name:ING 19: URINALYSES SHOULD NOT BE DONE DURING TREATMENT
PERIOD. DOSAGE SHOULD BE REDUCED IF ANY UNUSUAL URINARY (ING 21)
RTECS #:9999999ZZ

Ingred Name:ING 20:FINDINGS APPEAR. IV ADMIN IS CONTRAINDICATED IN PRESENCE OF ELEV CEREBROSPINAL FLUID PRESS. PENICILLAMINE(ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 21: IS ALSO EFTIVE IN COPPER POIS. GIVE UP TO 100 MG/KG/DAY (MAX 1G/DAY) DIVIDED INTO 4 DOSES FOR NO LONGER (ING 23)
RTECS #:9999999ZZ

Ingred Name:ING 22: THAN 1 WK. IF LONGER ADMIN PERIOD IS WARRANTED, DOSE SHOULD NOT EXCEED 40 MG/M3/DAY. GIVE DRUG ORALLY (ING 24)
RTECS #:9999999ZZ

Ingred Name:ING 23: 1/2 HR BEFORE MEALS. ANTIDOTE SHOULD BE AMIN BY QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHAL:ACUTE:INHAL OF COPPER DUST MAY CAUSE IRRIT OF UPPER RESP TRACT/AN ILLNESS SIMILAR TO COMMON COLD W/SENS OF CHILLS & STUFFINESS OF THE HEAD. CHRONIC:PRLNGD INHAL OF DUST/MIST OF COPPER SALTS MAY CAUSE CONGESTION OF NASAL MUC MEMB, SOMETIMES OF THE PHARYNX, & ON OCCASIONS ULCERATION & PERFORATION (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:OF NASAL SEPTUM. ATROPHIC CHANGES IN THE MUC MEMB WERE NOTED IN SUBJECTS EXPOSED TO COMPLEX COPPER SALTS FOR LONG PERIODS OF TIME. INHAL OF COPPER CMPNDS HAS CAUSED INJURY TO LUNGS & LIVER W/ HEMOCHROMATOSIS IN ANIMALS. SKIN:ACUTE:MAY CAUSE IRRIT. COPPER SALTS HAVE BEEN REPORTED TO CAUSE AN ITCHING (SUPP DATA)
Medical Cond Aggravated by Exposure:PERSONS WITH PRE-EXISTING RESPIRATORY, LIVER, SKIN, KIDNEY, HEMATOPOIETIC OR WILSON'S DISEASE.

=====
===== First Aid Measures =====

First Aid:INHAL:REMOVE FROM EXPOSURE TO FRESH AIR IMMED. IF BRTHG HAS STOPPED, PERFORM ARTF RESP. KEEP PERSON WARM & AT REST. TREAT SYMPTOMATICALLY & SUPPORTIVELY. GET MED ATTN IMMED. SKIN:REMOVE CONTAM CLTHG & SHOES IMMED. WASH AFFECTED AREA W/SOAPOR MILD DETERGENT & LRG AMTS OF WATER UNTIL NO EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MED ATTN IMMED. EYE: WASH EYES IMMED W/LRG AMTS OF (ING 10)

=====
===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM. LRG FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM.
Fire Fighting Procedures:NO ACUTE HAZ. MOVE CNTNR FROM FIRE AREA IF POSS. AVOID BRTHG VAPS OR DUSTS; KEEP UPWIND. WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO

HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures:OCCUPATIONAL SPILL: FOR LARGE SPILLS, SWEEP UP WITH A MINIMUM OF DUSTING AND PLACE INTO SUITABLE CLEAN, DRY CONTAINERS FOR RECLAMATION OR LATER DISPOSAL. RESIDUE SHLD BE CLEANED UP USING A HIGH-EFFICIENT PARTICULATE FILTER VACUUM.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OF THIS SUBSTANCE, FOR ASSISTANCE, CONTACT DISTRICT DIRECTOR OF EPA.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAM LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESP AND BE NIOSH/MSHA APPROVED. FOR SPECIFIC RESPIRATOR INFORMATION CONTACT NEHC .
Ventilation:PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:ANSI APPROVED CHEM SAFETY GOGGLES .
Other Protective Equipment:EMERGENCY EYEWASH FOUNTAIN.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
MATERIALS TO AVOID:HYDROGEN SULFIDE, HYDROGEN TRISULFIDE, HYDROXYLAMINE, MAGNESIUM, PHOSPHAM, PHTHALIC ANHYDRIDE, POTASSIUM, RUBIDIUM ACETYLIDE & ACETYLENE CARBIDE, SODIUM, TITANIUM, ZIRCONIUM. EFFECTS OF OVER EXPOSURE:PAPULOVESICULAR, SKIN DISCOLORATION & ECZEMATOID LESIONS.
CHRONIC: RPTD/PRLNGD CONTACT WITH SOME COPPER SALTS (ING 2)

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:2419F,1326C
Spec Gravity:6.3-6.49
Solubility in Water:INSOLUBLE
Appearance and Odor:BLACK TO BROWNISH-BLACK CRYSTALS OR POWDER.

===== Stability and Reactivity Data =====

ALUMINUM, ANILINIUM PERCHLORATE, BORON, CESIUM ACETYLENE CARBIDE, DICHLOROMETHYLSILANE, HYDRAZINE, HYDROGEN, (SUPP DATA)
Stability Condition to Avoid:NONE REPORTED.
Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE TOXIC AND/OR HAZARDOUS GASES.

===== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

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SIGMA CHEMICAL CO -- CUPRIC SULFATE ANHYDROUS, C1297 -- 6505-00N062350

=====
Product Identification
=====

Product ID:CUPRIC SULFATE ANHYDROUS, C1297

MSDS Date:04/05/1991

FSC:6505

NIIN:00N062350

MSDS Number: BYFTL

=== Responsible Party ===

Company Name:SIGMA CHEMICAL CO

Box:14508

City:SAINT LOUIS

State:MO

ZIP:63178

Country:US

Info Phone Num:800-325-3010

Emergency Phone Num:314-771-5765

CAGE:0DK69

=== Contractor Identification ===

Company Name:ALDRICH CHEMICAL CO INC

Address:1001 WEST ST PAUL AVE

Box:355

City:MILWAUKEE

State:WI

ZIP:53233

Country:US

Phone:414-273-3850

CAGE:60928

Company Name:SIGMA CHEMICAL CO SIGMA DIAGNOSTICS DIV

Address:3050 SPRUCE ST

Box:City:ST LOUIS

State:MO

ZIP:63103-2530

Country:US

Phone:314-771-5765

CAGE:0DK69

=====
Composition/Information on Ingredients
=====

Ingred Name:COPPER (II) SULFATE (1:1) (SARA 313) (CERCLA)

CAS:7758-98-7

RTECS #:GL8800000

OSHA PEL:1 MG/M3 (CU)

ACGIH TLV:1 MG/M3 (CU)

EPA Rpt Qty:10 LBS

DOT Rpt Qty:10 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 300 MG/KG.

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE:HARMFUL IF SWALLOWED,

INHALED/ABSORBED THRU SKIN. CAUSES SKIN IRRIT. CAUSES SEV EYE

IRRIT. MATL IS IRRIT TO MUC MEMBS & UPPER RESP TRACT. EXPOS CAN

CAUSE: DMG TO EYES, GI DISTURBS. CHRONIC:LAB E XPTS HAVE SHOWN

MUTAGENIC EFTS. TARGET ORGAN(S):LIVER, KIDNEYS, BLOOD. TARGET ORGAN DATA:BEHAVIORAL (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HLTH HAZ:(CONVLS/EFT ON SEIZURE THRESHOLD; FOOD INTAKE). GI (GASTRITIS; HYPERMOTILITY, DIARR; NAUS/VOMIT). KIDNEY, URETER, BLADDER (CHANGES IN TUBULES). ENDOCRINE (TUMORS). BLOOD (OTHER HEMOLYSIS WITH OR W/OUT ANEMIA). PATERNAL EFTS (SPERMATOGENESIS; TESTES, EPIDIDYMIS, SPERM DUCT). EFTS ON FERTILITY (POST- (SUPP DATA)

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:SKIN:IMMEDIATELY WASH W/SOAP & COPIOUS AMOUNTS OF WATER. REMOVE & WASH CONTAMINATED CLOTHING PROMPTLY. EYES:IMMEDIATELY FLUSH W/COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. INHAL:REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGEST:WASH OUT MOUTH W/WATER PROVIDED PERSON IS CONSCIOUS. CALL MD.

=====
===== Fire Fighting Measures =====

Extinguishing Media:NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR NIOSH/MSHA APPROVED RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS & HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG & HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA & WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:DO NOT GET IN EYES, ON SKIN, ON CLOTHING. DO NOT BREATHE DUST. TOXIC. SEVERE EYE IRRITANT. POSSIBLE MUTAGEN. KEEP TIGHTLY CLOSED. PROTECT FROM AIR.

Other Precautions:HYGROSCOPIC. HANDLE & STORE UNDER NITROGEN.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR IN NONVENTILATED AREAS &/OR FOR EXPOSURE ABOVE ACGIH TLV.

Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.

Protective Gloves:LONG RUBBER/NEOPRENE GAUNTLET GLOVES.

Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .

Other Protective Equipment:SAFETY SHOWER & EYE BATH. RUBBER APRON.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

EFTS OF OVEREXP:IMPLANTATION MORTALITY; OTHER MEASURES OF FERTILITY). EFTS ON EMBRYO/FETUS (FETOTOX). SPECIFIC DEVEL ABNORMS (CNS; BODY WALL; CVS). TUMORIGENIC (EQUIVOCAL TUMORIGENIC AGENT BY RTECS CRITERIA). WASTE DISP METH:HYPOCHLORITE. NEUT SOLN BEFORE FLUSHING

DOWN DRAIN. OBSERVE ALL FED, STATE & LOC ENVIRON REGS.

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:392F,200C
Vapor Pres:7.3 @ 25C
Spec Gravity:3.603
Appearance and Odor:LIGHT-GREY POWDER.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
CORRODES STEEL. FINELY POWDERED METALS. ANHYDROUS COPPER (II) SULFATE
REACTS VIOLENTLY W/HYDROXYLAMINE, MAGNESIUM.
Stability Condition to Avoid:MOISTURE. SENSITIVE TO AIR.
Hazardous Decomposition Products:TOXIC FUMES OF: SULFUR OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:MATL SHOULD BE DISSOLVED IN 1)WATER; 2)ACID SOLN
OR 3)OXIDIZED TO WATER-SOL STATE. PRECIP MATL AS SULFIDE, ADJUSTING
PH OF SOLN TO 7 TO COMPLETE PRECIP. FILTER INSOLS & DISP OF THEM IN
HAZ-WASTE SITE. DESTROY ANY EXCESS SULFIDE W/SODIUM (SUPP DATA)

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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

International Chemical Safety Cards

COPPER (I) OXIDE

ICSC: 0421

<p>COPPER (I) OXIDE Dicopper oxide Cuprous oxide Red copper oxide Cu_2O Molecular mass: 143.1</p> <p>CAS # 1317-39-1 RTECS # GL8050000 ICSC # 0421 EC # 029-002-00-X</p>

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
• INHALATION	Cough. Sore throat. Metal fume fever. Metallic taste. See Notes.	Local exhaust or breathing protection.	Fresh air, rest.
• SKIN	Dry skin.		Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES	Redness. Pain.	Safety goggles, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION	Abdominal pain. Diarrhoea. Nausea. Vomiting. Metallic taste.	Do not eat, drink, or smoke during work.	Rinse mouth. Give plenty of water to drink. Refer for medical attention.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING	
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to		Xn symbol R: 22 S: (2-)22	

safe place (extra personal protection: P2 filter respirator for harmful particles).

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0421

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993

International Chemical Safety Cards

COPPER (I) OXIDE

ICSC: 0421

I M P O R T A N T D A T A	PHYSICAL STATE; APPEARANCE: YELLOW, RED OR BROWN CRYSTALLINE POWDER.	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation and by ingestion.
	PHYSICAL DANGERS:	INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.
	CHEMICAL DANGERS:	
	OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV (as Cu, dust and mists): 1 mg/m ³ ; (as Cu, fume: 0.2 mg/m ³) (ACGIH 1996). MAK as Cu: ppm; mg/m ³ 1 (1996).	EFFECTS OF SHORT-TERM EXPOSURE: The substance irritates the eyes and the respiratory tract. Inhalation of fume may cause metal fever. The substance may cause effects on the kidneys and liver after ingestion. The effects may be delayed.
		EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis.
PHYSICAL PROPERTIES	Decomposes below boiling point at 1800°C Melting point: 1232°C	Relative density (water = 1): 6.0 Solubility in water: none
ENVIRONMENTAL DATA		
NOTES		
Headache, cough, sweating, nausea and fever may be caused by freshly formed fumes or dust of copper oxide. The symptoms of metal fume fever do not become manifest until 4-12 hours after exposure. C.I. 77402, Copox, Copper Nordox, Copper Sardex, Perenox, Yellow Cuprocide are trade names.		
Transport Emergency Card: TEC (R)-61G11c		

ADDITIONAL INFORMATION

ICSC: 0421

COPPER (I) OXIDE

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**IMPORTANT
LEGAL
NOTICE:**

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ATOMERGIC CHEMETALS CORP -- COPPER SULFIDE, CHALCOCITE, CUPROUS
SULFIDE -- 6810-00N055793

=====
Product Identification
=====

Product ID:COPPER SULFIDE, CHALCOCITE, CUPROUS SULFIDE
MSDS Date:10/05/1990
FSC:6810
NIIN:00N055793
MSDS Number: BWCPM
=== Responsible Party ===
Company Name:ATOMERGIC CHEMETALS CORP
Address:222 SHERWOOD AVE
City:FARMINGDALE
State:NY
ZIP:11735-1718
Country:US
Info Phone Num:516-694-9000
Emergency Phone Num:516-694-9000
CAGE:1S133

==== Contractor Identification ====

Company Name:ATOMERGIC CHEMETALS CORP
Address:91 CAROLYN BLVD
Box:City:FARMINGDALE
State:NY
ZIP:11735-1527
Country:US
CAGE:1S133

=====
Composition/Information on Ingredients
=====

Ingred Name:COPPER SULFIDE
CAS:22205-45-4
RTECS #:GL8910000
Fraction by Wt: 100%
OSHA PEL:1 MG/M3 (AS CU)
ACGIH TLV:1 MG/M3 (AS CU)

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHAL:RESP IRRIT. IRRIT, SNEEZING,
COUGHING, DFCLTY BRTHG & PULM EDEMA POSS. SKIN:ITCHING, REDNESS,
INFLAMM & DERM POSS. EYE:IRRIT, WATERING, REDNESS, POSS OF BURNS &
TISS DMG. INGEST:NAUS, VOMIT, SAL IVATION, STOMACH CRAMPS, DIZZ &
DIARR POSS. MAY CAUSE LIVER, KIDNEY & NERVOUS SYS DMG WITH CHRONIC
(EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:EXPOS. MUTAGENIC. AS THE SUBLIMED
OXIDE, COPPER MAY BE RESPONSIBLE FOR ONE FORM OF METAL FUME FEVER.
INHAL OF COPPER DUST HAS CAUSED, IN ANIMALS, HEMOLYSIS OF RED BLOOD
CELLS, DEPOSITION OF H EMOFUSCIN IN LIVER & PANCREAS, & INJURYTO
LUNG CELLS. CUPROUS OXIDE IS IRRIT TO EYES & UPPER RESP TRACT.
(SUPP DATA)
Medical Cond Aggravated by Exposure:RESPIRATORY DISORDERS.

=====
First Aid Measures
=====

First Aid:INGEST:GIVE 2 GLASSES OF WATER AND INDUCE VOMITING.
INHAL:REMOVE TO FRESH AIR; GIVE OXYGEN IF BREATHING IS DIFFICULT.
SEEK MEDICAL ATTENTION. SKIN:BRUSH MATERIAL OFF SKIN AND WASH AREA
WITH SOAP AND WATER. SEEK MEDICAL ATTENTION. EYE:FLUSH EYES WITH
LUKEWARM WATER FOR AT LEAST 15 MINUTES AND SEEK MEDICAL ATTENTION.

=====
Fire Fighting Measures
=====

Flash Point:NON APPLICABLE
Extinguishing Media:USE DRY CHEMICAL, CO₂.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:MATERIAL EMITS TOXIC FUMES OF SO₂ WHEN HEATED
TO DECOMP. HYDROGEN SULFIDE EVOLVED CAN FORM EXPLOSIVE MIXTURE WITH AIR. UPON
CONTACT WITH MOISTURE/ACIDS HYDROGEN SULFIDE MAY (SUP DAT)

=====
Accidental Release Measures
=====

Spill Release Procedures:WEAR A SCBA AND FULL PROTECTIVE CLOTHING.
ISOLATE AREA WHERE THE SPILL OCCURRED AND INSURE PROPER VENTILATION
IS AVAILABLE. VACUUM UP SPILL USING A HIGH EFFICIENCY UNIT AND
PLACE IN A CONTAINER FOR PROPER DISPOSAL. TAKE CARE NOT TO RAISE
DUST.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
Handling and Storage
=====

Handling and Storage Precautions:STORE IN TIGHTLY CLOSED CONTAINERS IN
A COOL, DRY PLACE.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED DUST-MIST-FUME
CARTRIDGE RESPIRATOR.
Ventilation:LOCAL EXHAUST:MAINTAIN EXPOSURE BELOW TLV.
MECHANICAL:RECOMMENDED. SPECIAL:HANDLE IN CONTROLLED ATMOSPHERE.
Protective Gloves:NEOPRENE.
Eye Protection:ANSI APPROVED CHEM WORKER GOGGLES .
Other Protective Equipment:WEAR PROTECTIVE CLOTHING TO PREVENT CONTACT OF SKIN &
CLOTHING. ANSI APPROVED EMERGENCY EYE BATH & DELUGE SHOWER .
Work Hygienic Practices:WASH HANDS AND FACE THOROUGHLY AFTER HANDLING
AND BEFORE EATING.
Supplemental Safety and Health
SOLUBLE IN WATER:1X10⁻¹⁴ G/100 ML. EXPLOSIVE HAZARD:BE AVOIDED. MANY POWERFUL
OXIDIZERS ON CONTACT WITH SULFIDES IGNITE VIOLENTLY. EFFECTS OF
OVEREXPOSURE:DISCOLORATION OF THE SKIN IS OFTEN SEEN IN PERSONS HANDLING
COPPER, BUT THIS DOES NOT INDICATE ANY ACTUAL INJURY FROM COPPER.

=====
Physical/Chemical Properties
=====

Melt/Freeze Pt:M.P/F.P Text:2012F,1100C
Evaporation Rate & Reference:N/A(H₂O=1)
Solubility in Water:INSOLUBLE (SUP DAT)

Appearance and Odor:BLUISH-BLACK CRYSTALLINE POWDER

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:NO
OXIDIZERS, ACIDS.
Stability Condition to Avoid:HEATING IN AIR.
Hazardous Decomposition Products:SO*X, CN FUMES (THERMAL), H*2S.
Conditions to Avoid Polymerization:HEAT, INCOMPATIBLE MATERIALS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH APPLICABLE
FEDERAL, STATE AND LOCAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

D-Glucosamine Hydrochloride, 98%

ACC# 45769

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Glucosamine Hydrochloride, 98%

Catalog Numbers: AC119900000, AC119900100, AC119900250, AC119901000, AC119905000

Synonyms:

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
66-84-2	D-Glucosamine Hydrochloride	98	200-638-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Not available.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Glucosamine Hydrochloride	none listed	none listed	none listed

OSHA Vacated PELs: D-Glucosamine Hydrochloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 190.00 - 194.00 deg C

Decomposition Temperature: Not available.

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₃NO₅.HCl

Molecular Weight: 215.64

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 66-84-2: LZ6665000

LD50/LC50:

CAS# 66-84-2:

Oral, mouse: LD50 = 15 gm/kg;

Carcinogenicity:

CAS# 66-84-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 66-84-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 66-84-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 66-84-2: No information available.

Canada - DSL/NDSL

CAS# 66-84-2 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

alpha-D-(+)-Lactose monohydrate

ACC# 45372

Section 1 - Chemical Product and Company Identification

MSDS Name: alpha-D-(+)-Lactose monohydrate

Catalog Numbers: S71955, S71956, L5-500, L6-200LB, L6-212, L6-500, L8-12, L8-212

Synonyms: Milk Sugar; Lactin; Lactobiose; 4-(beta-d-Galactosido)-d-Glucose; Soccharum Lactin

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5989-81-1	alpha-D-Lactose monohydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye and skin irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. The

toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust can be an explosion hazard when exposed to heat or flame.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
alpha-D-Lactose monohydrate	none listed	none listed	none listed

OSHA Vacated PELs: alpha-D-Lactose monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Decomposes
Freezing/Melting Point: 219 deg C
Decomposition Temperature: > 219 deg C
Solubility: Soluble in water.
Specific Gravity/Density: 1.525
Molecular Formula: C₁₂H₂₂O₁₁.H₂O
Molecular Weight: 360.32

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 5989-81-1 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 5989-81-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5989-81-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5989-81-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 5989-81-1: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Decanoic acid

ACC# 66455

Section 1 - Chemical Product and Company Identification

MSDS Name: Decanoic acid

Catalog Numbers: AC111900000, AC111900010, AC111901000, AC167270000, AC167271000, AC167275000, S76767

Synonyms: Capric acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
334-48-5	Decanoic acid	96+	206-376-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light yellow solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: Chronic exposure may cause blood effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 113 deg C (235.40 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Decanoic acid	none listed	none listed	none listed

OSHA Vacated PELs: Decanoic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to light yellow

Odor: none reported

pH: 4.6 (0.01 g/L aq.sol.)

Vapor Pressure: 0.13 hPa @ 79 deg C

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 268 - 270 deg C @ 760 mmHg

Freezing/Melting Point:30 - 32 deg C

Decomposition Temperature:Not available.

Solubility: 0.15 g/L (20°C)

Specific Gravity/Density:0.890

Molecular Formula:C10H20O2

Molecular Weight:172.27

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, reducing agents, bases.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 334-48-5: HD9100000

LD50/LC50:

CAS# 334-48-5:

Draize test, rabbit, skin: 500 mg/24H Moderate;

Oral, rat: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 334-48-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Killifish: LC50 = 20 mg/L; 96 Hr.; Unspecified No data available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 334-48-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 334-48-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 334-48-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 334-48-5: 1

Canada - DSL/NDSL

CAS# 334-48-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 334-48-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Carbon, decolorizing NORIT A (now sold as NORIT SA-3)

ACC# 95961

Section 1 - Chemical Product and Company Identification

MSDS Name: Carbon, decolorizing NORIT A (now sold as NORIT SA-3)

Catalog Numbers: AC404030000, AC404030030, AC404035000

Synonyms: Synthetic graphite; Acetylene black; Black pearls; Carbon, activated.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-44-0	Carbon	100	231-153-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black solid.

Caution! May cause eye irritation. May cause lung damage.

Target Organs: Lungs.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: Dust is irritating to the respiratory tract. May cause lung damage.

Chronic: Chronic inhalation may lead to decreased pulmonary function.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Dust can be an explosion hazard when exposed to heat or flame. Can be easily ignited and burns vigorously. Containers may explode if exposed to fire.

Extinguishing Media: For large fires, use water spray, fog or alcohol-resistant foam. For small fires, use dry chemical, carbon dioxide, sand, earth, water spray or regular foam. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: Not applicable.

Autoignition Temperature: 230 deg C (446.00 deg F)

Explosion Limits, Lower:N/A

Upper: N/A

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Carbon	none listed	none listed	none listed

OSHA Vacated PELs: Carbon: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: black

Odor: Odorless.

pH: Not available.

Vapor Pressure: 1 mm Hg @ 3586C

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Sublimes @ 3652 deg C

Freezing/Melting Point: 3652 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 1.8-2.1

Molecular Formula: C

Molecular Weight: 12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: May react vigorously or violently when mixed with strong oxidizing agents such as chlorates, bromates and nitrates, especially when heated. Incompatible with chlorinated paraffins, Lead oxide, manganese oxide, iron oxide, liquid oxygen, oils, and moisture.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-44-0: FF5250100

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7440-44-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Particulates settle out of atmosphere and water.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-44-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-44-0: immediate.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-44-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7440-44-0: 0

Canada - DSL/NDSL

CAS# 7440-44-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Deoxyribonucleic Acid

ACC# 08465

Section 1 - Chemical Product and Company Identification

MSDS Name: Deoxyribonucleic Acid

Catalog Numbers: S79993

Synonyms: DNA; Calf thymus DNA

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9007-49-2	Deoxyribonucleic Acid	100.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to tan solid.

Caution! May cause respiratory tract irritation. May cause skin irritation. May cause eye irritation.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Keep away from heat and flame. Store in a cool, dry place. Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Deoxyribonucleic Acid	none listed	none listed	none listed

OSHA Vacated PELs: Deoxyribonucleic Acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to tan

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Slightly soluble in water.

Specific Gravity/Density: Not available.

Molecular Formula: Not applicable.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9007-49-2: HG1933000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 9007-49-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9007-49-2 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9007-49-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 9007-49-2: No information available.

Canada - DSL/NDSL

CAS# 9007-49-2 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Dextrin

ACC# 90255

Section 1 - Chemical Product and Company Identification

MSDS Name: Dextrin

Catalog Numbers: S76768

Synonyms: Artificial gum; Starch gum; Tapioca; Vegetable gum.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9004-53-9	Dextrin	100	232-675-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Minimize dust

generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep container closed when not in use. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Dextrin	none listed	none listed	none listed

OSHA Vacated PELs: Dextrin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Protective garments not normally required.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to off-white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 5.6

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in hot water.

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₀O₅

Molecular Weight: 162.067

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 9004-53-9: HH9450000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 9004-53-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9004-53-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9004-53-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9004-53-9: 0

Canada - DSL/NDSL

CAS# 9004-53-9 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

D-Fructose

ACC# 06165

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Fructose

Catalog Numbers: AC161350010, AC161350025, AC161355000, AC219570010, AC219572500, S72221C, S76787, S80020, S93276, L95-500, L96-12, L96-212, L96-500, L96100LB

Synonyms: Fruit sugar; D(-)-Fructose; Levulose; Fructose.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
57-48-7	D-Fructose	>98	200-333-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: Low hazard for usual industrial handling.

Ingestion: Low hazard for usual industrial handling.

Inhalation: Dust is irritating to the respiratory tract. Low hazard for usual industrial

handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust from this material can form explosive organic dust cloud.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Fructose	none listed	none listed	none listed

OSHA Vacated PELs: D-Fructose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Protective garments not normally required.

Clothing: Protective garments not normally required.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 103-105 deg C (dec)

Decomposition Temperature: 103-105 deg C

Solubility: Freely Soluble.

Specific Gravity/Density: Not available.

Molecular Formula:C6H12O6

Molecular Weight:180.16

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 57-48-7: LS7120000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 57-48-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 57-48-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 57-48-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 57-48-7: 0

Canada - DSL/NDSL

CAS# 57-48-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

D-Galactose, 98% (HPLC)

ACC# 00654

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Galactose, 98% (HPLC)

Catalog Numbers: AC410840000, AC410841000, AC410845000

Synonyms: D-Galactopyranose

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
59-23-4	D-Galactose	ca. 100%	200-416-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This substance has caused adverse reproductive and fetal effects in animals. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Galactose	none listed	none listed	none listed

OSHA Vacated PELs: D-Galactose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: 6.2

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 167 deg C

Decomposition Temperature: Not available.

Solubility: 680 g/l (25 C) in water.

Specific Gravity/Density: Not available.

Molecular Formula:C6H12O6

Molecular Weight:180.0804

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 59-23-4: LW5490000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 59-23-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Effects on Newborn: Germ cell effects, oral-rat TDLo=1000g/kg; Growth Statistics, oral-rat TDLo=440g/kg; Live birth index, oral-mouse TDLo=165g/kg. Embryo or fetus, oral-rat TDLo=240g/kg.

Reproductive Effects: Fertility: Abortion, oral-mouse TDLo=1260g/kg.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 59-23-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 59-23-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 59-23-4: 0

Canada - DSL/NDSL

CAS# 59-23-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

3,3'-Diazido-Diphenylsulfone, 97%

ACC# 36679

Section 1 - Chemical Product and Company Identification

MSDS Name: 3,3'-Diazido-Diphenylsulfone, 97%

Catalog Numbers: AC294730000, AC294730050

Synonyms: None Known.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
75742-13-1	3,3'-Diazido-Diphenylsulfone	97%	278-300-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Warning! Causes eye and respiratory tract irritation. May cause skin irritation. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: Causes respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.) Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
3,3'-Diazido-Diphenylsulfone	none listed	none listed	none listed

OSHA Vacated PELs: 3,3'-Diazido-Diphenylsulfone: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 108.00 - 110.00 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: Not available.

Molecular Formula: C₁₂H₈N₆O₂S

Molecular Weight: 300.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light, excess heat, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide, nitrogen gas, sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 75742-13-1 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 75742-13-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 75742-13-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 75742-13-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.
R 36/37 Irritating to eyes and respiratory system.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37 Wear suitable gloves.
S 39 Wear eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 75742-13-1: No information available.

Canada - DSL/NDSL

CAS# 75742-13-1 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

International Chemical Safety Cards

DIMETHYLAMINE

ICSC: 0260

<p>DIMETHYLAMINE N-Methyl methanamine (cylinder) (CH₃)₂NH Molecular mass: 45.1</p> <p>CAS # 124-40-3 RTECS # IP8750000 ICSC # 0260 UN # 1032 (anhydrous) EC # 612-001-00-9</p>
--

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Extremely flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking.	Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out; in other cases extinguish with powder, carbon dioxide.
EXPLOSION	Gas/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Use reduced-sparking handtools.	In case of fire: keep cylinder cool by spraying with water.
EXPOSURE		STRICT HYGIENE!	
• INHALATION	Abdominal pain. Burning sensation. Cough. Diarrhoea. Laboured breathing. Shortness of breath. Sore throat.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Half-upright position. Artificial respiration if indicated. Refer for medical attention.
• SKIN	Redness. Skin burns. Pain.	Cold-insulating gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
• EYES	Redness. Pain. Blurred vision. Severe deep burns.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION			Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Refer for medical

		attention.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Consult an expert! Ventilation. Do NOT wash away into sewer. Remove with fine water spray (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Fireproof. Separated from incompatible materials (see Chemical Dangers). Cool.	F symbol Xi symbol R: 13-36/37 S: 16-26-29 UN Haz Class: 2.1
SEE IMPORTANT INFORMATION ON BACK		
ICSC: 0260	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993	

International Chemical Safety Cards

DIMETHYLAMINE

ICSC: 0260

I M P O R T A N T D A T A	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS COMPRESSED LIQUEFIED GAS, WITH CHARACTERISTIC ODOUR.</p> <p>PHYSICAL DANGERS: The gas is heavier than air and may travel along the ground; distant ignition possible.</p> <p>CHEMICAL DANGERS: The substance decomposes on burning producing toxic fumes (nitrogen oxides). The substance is a medium strong base. Reacts violently with strong oxidants, such as chlorine. Reacts violently with mercury causing fire and explosion hazard. Attacks plastics, rubber, and coatings.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV (as TWA): 10 ppm; 18 mg/m³ (ACGIH 1992-1993). MAK: 10 ppm; 18 mg/m³; (1992).</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation and through the skin.</p> <p>INHALATION RISK: A harmful concentration of this gas in the air will be reached very quickly on loss of containment.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: The vapour is corrosive to the eyes, the skin and the respiratory tract. Inhalation of the substance may cause lung oedema (see Notes). Rapid evaporation of the liquid may cause frostbite.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis.</p>
	PHYSICAL PROPERTIES	<p>Boiling point: 7°C Melting point: -92°C Solubility in water, g/100 ml at 20°C: 23.7 Vapour pressure, kPa at 20°C: 206 Relative vapour density (air = 1): 1.56</p> <p>Flash point: Flammable Gas Auto-ignition temperature: 402°C Explosive limits, vol% in air: 2.8-14.4 Octanol/water partition coefficient as log Pow: -0.38</p>

**ENVIRONMENTAL
DATA**

This substance may be hazardous to the environment; special attention should be given to water organisms.

NOTES

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorized by him/her, should be considered. The odour warning when the exposure limit value is exceeded is insufficient. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.

Transport Emergency Card: TEC (R)-30G33
NFPA Code: H 3; F 4; R 0;

ADDITIONAL INFORMATION**ICSC: 0260****DIMETHYLAMINE**

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**IMPORTANT
LEGAL
NOTICE:**

Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

TIMMONS & CHARLES, INC. -- TETRASODIUM ETHYLENEDIAMINETETRAACETATE
-- 6810-01-109-3911

=====
Product Identification
=====

Product ID:TETRASODIUM ETHYLENEDIAMINETETRAACETATE
MSDS Date:01/01/1987
FSC:6810
NIIN:01-109-3911
MSDS Number: BGMFV
=== Responsible Party ===
Company Name:TIMMONS & CHARLES, INC.
Emergency Phone Num:201-862-9100
CAGE:LO772
=== Contractor Identification ===
Company Name:TIMMONS & CHARLES, INC.
CAGE:LO772
Company Name:TIMMONS AND CHARLES INC
Address:991 E LINDEN AVE
Box:1175
City:LINDEN
State:NJ
ZIP:07036-2416
Country:US
Phone:908-862-9100/FAX908-862-1680
CAGE:5G937

=====
Composition/Information on Ingredients
=====

Ingred Name:TETRASODIUM ETHYLENEDIAMINETETRAACETATE, CAS 64-02-8
CAS:64-02-8
RTECS #:AH5075000
Fraction by Wt: 84%.

Ingred Name:NITRILOTRIACETIC ACID (SARA III)
CAS:139-13-9
RTECS #:AJ0175000
Fraction by Wt: <0.2%

Ingred Name:WATER, CAS 7732-18-5 (ACTUAL WT%=<15.8)
CAS:7732-18-5
RTECS #:ZC0110000
Fraction by Wt: 15.8%

=====
Hazards Identification
=====

Effects of Overexposure:EYE,SKN:IRRT.INHL:NONE. INGEST:MAY INCREAS
ABSORPTION OF OTHERTOXICS FROM GI TRACT,IRRT,HYPOCALCEMIA

=====
First Aid Measures
=====

First Aid:EYE:FLUSH 15 MIN W/AMPLE WATER.SKN:WASH SOAP &
WATER.INHL:REMOVE TO FRESH AIR. GIVE ART RESP,O*2 AS REQD.
INGEST:IF CONSC, GIVE AMPLE WATER OR MILK. CALL PHYSICIAN IF
SYMPTOMS PERSISTS.

=====
Fire Fighting Measures
=====

Autoignition Temp:Autoignition Temp Text:NONE
Extinguishing Media:NONE
Fire Fighting Procedures:NONE
Unusual Fire/Explosion Hazard:NONE

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP OR VACUUM POWDER INTO CLOSED
CONTAINER. DILUTE SMALL AMOUNTS WITH WATER & FLUSH TO SEWER

===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINERS CLOSED. STORE IN COOL
DRY LOCATION.
Other Precautions:AVOID PROLONGED CONTACT WITH MATERIAL. DO NOT INHALE
DUST.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE DUST MASK AS REQD
Ventilation:LOCAL, GENERAL MECHANICAL
Protective Gloves:NEOPRENE
Eye Protection:GOGGLES
Other Protective Equipment:AVOID SKN/EYE CONTACT.
Supplemental Safety and Health
MSDS DTD 25JUN86.

===== Physical/Chemical Properties =====

HCC:N1
Evaporation Rate & Reference:0
Solubility in Water:COMPLETE
Appearance and Odor:ODORLESS WHITE CRYSTALS. PH1% SOLN =10.5-11.5
Percent Volatiles by Volume:15.8

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NONE
Stability Condition to Avoid:KEEP DRY
Hazardous Decomposition Products:CARBON, NITROGEN, SULFUR OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:LANDFILL OR INCINERATE IAW ALL LAWS & REGS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

DL-Aspartic Acid

ACC# 62635

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Aspartic Acid

Catalog Numbers: S71819

Synonyms: DI-Aminosuccinic Acid; Asparacemic Acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
617-45-8	dl-Aspartic Acid	app.99	210-513-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. May form flammable dust-air mixtures. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
dl-Aspartic Acid	none listed	none listed	none listed

OSHA Vacated PELs: dl-Aspartic Acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: 4.6

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 277.8 deg C

Decomposition Temperature: 277.8 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 1.66 (water=1)

Molecular Formula: C₄H₇NO₄

Molecular Weight: 133.0533

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 617-45-8: CI9097800

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 617-45-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 617-45-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 617-45-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 617-45-8: 0

Canada - DSL/NDSL

CAS# 617-45-8 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-Leucine

ACC# 96707

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Leucine

Catalog Numbers: AC172130000, AC172130250, AC172132500, AC413110000, AC413110250, AC413111000 AC413111000, ACE1135193

Synonyms: DL-Leu; DL-2-Amino-4-methylpentanoic acid.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
328-39-2	DL-Leucine	99+	206-328-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Leucine	none listed	none listed	none listed

OSHA Vacated PELs: DL-Leucine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white - fine

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 293 - 296 deg C(subl)

Decomposition Temperature: Not available.

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₃NO₂

Molecular Weight: 131.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 328-39-2 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 328-39-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 328-39-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 328-39-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 328-39-2: No information available.

Canada - DSL/NDSL

CAS# 328-39-2 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-phenylalanine-d11

ACC# 24770

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-phenylalanine-d11

Catalog Numbers: AC233380000, AC233381000

Synonyms:

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
Not available	DL-Phenylalanine-d11		unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Not available.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: 1; Flammability: ; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Phenylalanine-d11	none listed	none listed	none listed

OSHA Vacated PELs: DL-Phenylalanine-d11: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: Not available.

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: C₉D₁₁NO₂

Molecular Weight: 176.28

Section 10 - Stability and Reactivity

Chemical Stability: Stability unknown.

Conditions to Avoid: Incompatible materials, dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

No CAS#s in product.

LD50/LC50:

No information

Carcinogenicity:

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

DL-Phenylalanine-d11 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-Alanine, 99%

ACC# 51357

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Alanine, 99%

Catalog Numbers: AC159090000, AC159091000, AC159095000

Synonyms: (+-)-2-Aminopropionic acid; (R,S)-Alanine; dl-2-Aminopropionic acid; DL-alpha-Alanine. L-Alanine is non-essential amino acid for human development.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
302-72-7	DL-Alanine	99	206-126-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Inhalation of dust may cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Gently lift eyelids and flush continuously with water. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Dark room.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Alanine	none listed	none listed	none listed

OSHA Vacated PELs: DL-Alanine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 5.5-7 (2.5% soln)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Sublimes above 200 deg C

Decomposition Temperature: 264-296 deg C

Solubility: 167 g/l @ 25°C

Specific Gravity/Density: 1.424

Molecular Formula: C₃H₇NO₂

Molecular Weight: 89.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Light, dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 302-72-7: AY2980000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 302-72-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Structure of the product is closely related to the natural amino acid L-alanine and may therefore be degraded microbiologically.

Environmental: No information available.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		
Additional Info:		OXALIC ACID

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 302-72-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 302-72-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 302-72-7: 0

Canada - DSL/NDSL

CAS# 302-72-7 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-Lysine monohydrochloride

ACC# 43661

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Lysine monohydrochloride

Catalog Numbers: AC413370000, AC413370250, AC413371000, ACE1176833, ACE1176841

Synonyms: None known.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
70-53-1	DL-Lysine monohydrochloride	99	200-739-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light yellow crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Lysine monohydrochloride	none listed	none listed	none listed

OSHA Vacated PELs: DL-Lysine monohydrochloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white to light yellow

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 267 deg C

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₄N₂O₂.HCl

Molecular Weight: 182.65

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, temperatures above 150°C.

Incompatibilities with Other Materials: Strong oxidizing agents

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 70-53-1 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 70-53-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 70-53-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 70-53-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 70-53-1: 0

Canada - DSL/NDSL

CAS# 70-53-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DL-Methionine

ACC# 17927

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Methionine

Catalog Numbers: AC125650000, AC125650025, AC125651000, AC125652500, AC295110000

Synonyms: DL-2-Amino-4-(methylthio)butyric acid; Racemethionine.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
59-51-8	DL-Methionine	>99	200-432-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust from this material can form explosive organic dust cloud.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container

tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.)

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DL-Methionine	none listed	none listed	none listed

OSHA Vacated PELs: DL-Methionine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: faint odor

pH: 5.6-6.1 (1% aq soln)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 270-281 deg C (dec)

Decomposition Temperature: 281 deg C

Solubility: 33.81 g/l @ 25°C

Specific Gravity/Density: 1.3400 g/cm³

Molecular Formula: C₅H₁₁NO₂S

Molecular Weight: 149.21

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 59-51-8: PD0456000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 59-51-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 59-51-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 59-51-8: fire.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 59-51-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 59-51-8: 0

Canada - DSL/NDSL

CAS# 59-51-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

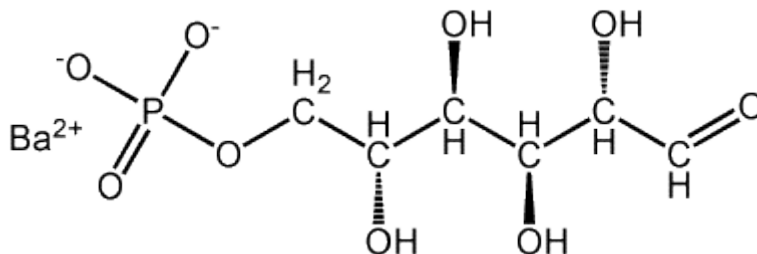
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

D-Mannose, 6-(dihydrogen phosphate), barium salt (1:1)

Formula $C_6H_{13}O_9P.Ba$

Structure



Registry Numbers and Inventories.

CAS	94030-87-2
NIH PubChem CID	3796094 (SID)
EC (EINECS/ELINCS)	301-693-5
UN (DOT)	1564
Beilstein/Gmelin	3922394
Beilstein Reference	4-01-00-04383
Korea ECL	Listed

Properties.

Formula	$C_6H_{11}BaO_9P$
Formula mass	397.46

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	ELIMINATE all ignition sources. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT GET WATER INSIDE CONTAINERS.
Stability	No data.

Fire.

Fire fighting	Extinguish using agent most appropriate for surrounding fire.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Contact with metals may evolve flammable hydrogen gas.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure effects

Ingestion See Inhalation.

Inhalation TOXIC; inhalation, ingestion, or skin contact with material may cause severe injury or death. Effects of contact or inhalation may be delayed.

Skin Contact with molten substance may cause severe burns to skin and eyes. See Inhalation.

Eyes See Inhalation.

First aid

Ingestion Seek medical assistance.

Inhalation Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.

Skin Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.

Eyes Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 1564

Response guide [154](#)

Hazard class 6.1



Packing Group II; III

Material Safety Data Sheet

Dowex 1x8-50 Ion-Exchange Resin

ACC# 51769

Section 1 - Chemical Product and Company Identification

MSDS Name: Dowex 1x8-50 Ion-Exchange Resin

Catalog Numbers: AC202980000, AC202981000, AC202985000

Synonyms: None.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
69772-06-1	Dowex(R) 1X8-50 ion-exchange resin	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: tan solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Dowex(R) 1X8-50 ion-exchange resin	none listed	none listed	none listed

OSHA Vacated PELs: Dowex(R) 1X8-50 ion-exchange resin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: tan

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 69772-06-1 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 69772-06-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 69772-06-1 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 69772-06-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 69772-06-1: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Drierite®, with indicator

ACC# 97068

Section 1 - Chemical Product and Company Identification

MSDS Name: Drierite®, with indicator

Catalog Numbers: AC219080000, AC219080020, AC219080050, AC219085000, AC219090000, AC219090020, AC219090020, AC219090050, AC219095000, AC219100000, AC219100020, AC219105000, AC219105000, AC350010000, AC350010020, AC350015000

Synonyms: Calcium sulfate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-18-9	Drierite®	96.75	231-900-3
7646-79-9	Cobalt chloride	3.25	231-589-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white granules.

Warning! Possible cancer hazard. May cause cancer based on animal data. May cause allergic respiratory and skin reaction. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause cancer by inhalation. Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause allergic respiratory reaction. May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause cancer according to animal studies. Adverse reproductive effects have been reported in animals. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals. Animal studies have reported the development of tumors.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Drierite®	10 mg/m ³ TWA (inhalable fraction)	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)
Cobalt chloride	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed

OSHA Vacated PELs: Drierite®: 15 mg/m³ TWA; 5 mg/m³ TWA (respirable fraction)
Cobalt chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Granules

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:1450 deg C (decom)

Decomposition Temperature:Not available.

Solubility: Slightly soluble.

Specific Gravity/Density:2.960

Molecular Formula:CaO4S

Molecular Weight:136.14

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, aluminum, azo, diazo, and hydrazines (e.g. dimethyl hydrazine, hydrazine, methyl hydrazine), alkali metals.

Hazardous Decomposition Products: Oxides of sulfur.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-18-9: WS6920000

CAS# 7646-79-9: GF9800000

LD50/LC50:

Not available.

CAS# 7646-79-9:

Oral, mouse: LD50 = 80 mg/kg;

Oral, rat: LD50 = 80 mg/kg;

Oral, rat: LD50 = 418 mg/kg;

Carcinogenicity:

CAS# 7778-18-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7646-79-9:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: Tumorigenic effects have been reported in experimental animals.IARC

Group 2B: Proven animal carcinogenic substance of potential relevance to humans. ACGIH has labeled this substance as a confirmed animal carcinogen.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Cobalt chloride)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Cobalt chloride)
Hazard Class:	9	9
UN Number:	UN3077	UN3077
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-18-9 is listed on the TSCA inventory.

CAS# 7646-79-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7646-79-9: immediate, delayed.

Section 313

This material contains Cobalt chloride (listed as Cobalt, inorganic compounds), 3.25%, (CAS# 7646-79-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7646-79-9 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-18-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7646-79-9 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T N

Risk Phrases:

R 42/43 May cause sensitization by inhalation and skin contact.

R 49 May cause cancer by inhalation.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 29 Do not empty into drains.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7778-18-9: 0

CAS# 7646-79-9: 2

Canada - DSL/NDSL

CAS# 7778-18-9 is listed on Canada's DSL List.

CAS# 7646-79-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

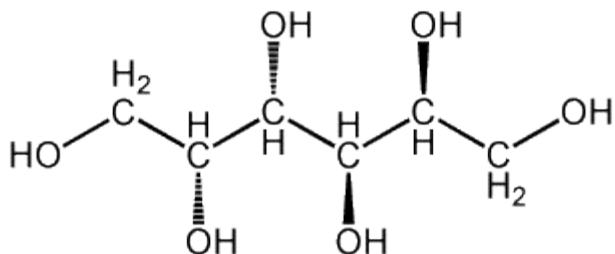
CAS# 7646-79-9 is listed on the Canadian Ingredient Disclosure List.

Galactitol

- Dulcitol
- Dulcite
- Euonymit
- Melampyrin
- Dulcose
- (2R,3S,4R,5S)-Hexane-1,2,3,4,5,6-hexol

Formula $C_6H_{14}O_6$

Structure



Description White crystals.

Uses

In people with galactokinase deficiency, excess galactitol formation in the lens of the eye leads to cataracts.

Registry Numbers and Inventories.

CAS	608-66-2
NIH PubChem CID	11850
EC (EINECS/ELINCS)	210-165-2
Merck	13,4353
Beilstein/Gmelin	1721903
Beilstein Reference	4-01-00-02844
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed

Properties.

Formula	$C_6H_{14}O_6$
Formula mass	182.17
Melting point, °C	168 - 169
Boiling point, °C	563
Vapor pressure, mm_{Hg}	5E-15 (25 C)

Density	1.466 g/cm ³ (15 C)
Solubility in water	Very soluble
pKa/pKb	13.14 (pKa)
Partition coefficient, pK_{ow}	-4.67
Heat of fusion	65.10 kJ/mol
Heat of vaporization	97.2 kJ/mol
Heat of combustion	-3054 kJ/mol

Hazards and Protection.

Storage	Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Oxidizing agents.
Decomposition	Carbon monoxide, carbon dioxide.

Fire.

Flash Point, °C	293
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

Health.

Exposure effects

Ingestion	May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.
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Inhalation May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Skin May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Eyes May cause eye irritation. The toxicological properties of this material have not been fully investigated.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

HS Code 2905 49 90

Material Safety Data Sheet

Albumin, egg (powder)

ACC# 00093

Section 1 - Chemical Product and Company Identification

MSDS Name: Albumin, egg (powder)

Catalog Numbers: AC400450000, AC400450500, 40045-1000, 40045-5000

Synonyms: Egg albumin; Egg white.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9006-59-1	Albumin egg	100	232-692-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine powder.

Caution! May cause eye, skin, and respiratory tract irritation. Heat sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Treat symptomatically and supportively. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion

and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Albumin egg	none listed	none listed	none listed

OSHA Vacated PELs: Albumin egg: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow-white - fine

Odor: Not available.

pH: 6 - 8

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 61 deg C @ 760 mm Hg

Freezing/Melting Point: 0 deg C

Decomposition Temperature: 60 deg C

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9006-59-1: AY9384000

LD50/LC50:

CAS# 9006-59-1:

Oral, mouse: LD50 = >24 gm/kg;

Carcinogenicity:

CAS# 9006-59-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9006-59-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9006-59-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9006-59-1: No information available.

Canada - DSL/NDSL

CAS# 9006-59-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Eosin Y

ACC# 60240

Section 1 - Chemical Product and Company Identification

MSDS Name: Eosin Y

Catalog Numbers: BP2419-100, BP2419-25, E511-100, E511-25, NC9215708, NC9412829, NC9607248

Synonyms: Acid Red 87; Bromoeosine; Disodium Eosine; Eosine Yellowish; Tetrabromfluorescein, CI 45380.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
17372-87-1	ACID RED 87	100	241-409-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red to brown solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: The use of sodium chloride as antidotal treatment for bromine salt overdose should be made only by qualified medical personnel (Medical Toxicology, 1988).

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
ACID RED 87	none listed	none listed	none listed

OSHA Vacated PELs: ACID RED 87: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: red to brown

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not applicable.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: C₂₀H₈Br₄O₅.2Na
Molecular Weight: 693.65

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, incompatible materials.
Incompatibilities with Other Materials: Strong oxidizers.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 17372-87-1: LM5850000
LD50/LC50:
CAS# 17372-87-1:
Oral, mouse: LD50 = 2344 mg/kg;

Carcinogenicity:
CAS# 17372-87-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: Please refer to RTECS# LM5850000 for specific information.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information reported.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 17372-87-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 17372-87-1: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 17372-87-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 17372-87-1: 1

Canada - DSL/NDSL

CAS# 17372-87-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

FISHER SCIENTIFIC, CHEMICAL DIV. -- E51225 ERIOCHROME (R) BLACK T -- 6810-00-070-7541

=====
===== Product Identification =====

Product ID:E51225 ERIOCHROME (R) BLACK T
MSDS Date:02/01/1995
FSC:6810
NIIN:00-070-7541
MSDS Number: BCXHD
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100 OR 201-796-7523
Emergency Phone Num:201-796-7100/800-424-9300 (CHEMTREC)
Preparer's Name:GASTON L. PILLORI
CAGE:1B464

=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:ERICHROME BLACK T
CAS:1787-61-7
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED

=====
===== Hazards Identification =====

Eye Protection:SPLASH-PROOF/DUST-RESIST SAF GOGG.
Other Protective Equipment:WEAR APPROPRIATE PROT (IMPERVIOUS)CLOTH/EQPMT
TO PREVENT REP/PROL SKIN CONTACT W/SUBSTANCE.EYEWASH FOUNTIAN W/IN
WORKAREA
Work Hygienic Practices:HMIS:LAUNDER CONTAMIN CLOTH BEF REUSE.
Supplemental Safety and Health
PH:3 (20G/L H2O). FIREFIGHTING:SURROUNDING FIRE.AVOID BREATH HAZ
VAP,KEEP UPWIND.

===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:B.P. Text:NP
Melt/Freeze Pt:M.P/F.P Text:374F,190C
Decomp Temp:Decomp Text:374F,190C
Vapor Pres:NP
Vapor Density:NP
Spec Gravity:N/AVAI
pH:SUPPLY
Viscosity:NP
Evaporation Rate & Reference:NEGL (N-BUTYL ACETATE=1)
Solubility in Water:APPRECIABLE,80%@100C
Appearance and Odor:ODORLESS, BROWYNISH-BLACK TO BLACK POWDER W/FAINT
METALLIC SHEEN.
Percent Volatiles by Volume:0
Corrosion Rate:NP

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS, REDUCING AGENTS.
Stability Condition to Avoid:MAY BURN BUT DOES NOT IGN READILY.AVOID
CONTACT W/STRONG OXIDIZERS,EXCESSIVE HEAT/SPARKS/OPEN FLAMES.
Hazardous Decomposition Products:THERMAL DECOMPO PROD MAY INCLUDE TOXIC
OXIDES OF CARBON, NITROGEN, SULFUR & SODIUM.

===== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL FED/STATE/LOC REGS WHEN DISPOSING
SUBSTANCE.

Disclaimer (provided with this information by the compiling agencies):
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of Defense. The United States of America in no manner whatsoever,
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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

FISHER SCIENTIFIC -- SODIUM DIETHYLDITHIOCARBAMATE TRIHYDRATE, S287-100 -- 6810-00N092920

=====
===== Product Identification =====

Product ID:SODIUM DIETHYLDITHIOCARBAMATE TRIHYDRATE, S287-100
MSDS Date:12/12/1997
FSC:6810
NIIN:00N092920
Status Code:A
MSDS Number: CJVWG
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:ONE REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
Chemtrec Ind/Phone:(800)424-9300
CAGE:1B464

==== Contractor Identification ===

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:CARBAMODITHIOIC ACID, DIETHYL-, SODIUM SALT, TRIHYDRATE;
(DIETHYLCARBAMODITHIOIC ACID SODIUM SALT TRIHYDRATE) LD50: (ORAL,
RAT) 1500 MG/KG EINECS/ELINCS: UNLISTED.
CAS:20624-25-3
RTECS #:EZ6550000
= Wt:100.

=====
===== Hazards Identification =====

LD50 LC50 Mixture:SEE INGREDIENT
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYE: MAY CAUSE EYE IRRITATION. SKIN:
MAY CAUSE SKIN IRRITATION. INGESTION: THE TOXICOLOGICAL PROPERTIES
OF THIS SUBSTANCE HAVE NOT BEEN FULLY INVESTIGATED. MAY BE HARMFUL
IF SWALLOWED. EXPOSURE TO SIM ILAR COMPOUNDS IN COMBINATION WITH
ALCOHOLS HAS CAUSED NAUSEA, VOMITING, BREATHING DIFFICULTY AND
HYPOTENSION. INHALATION: MAY CAUSE RESPIRATORY TRACT IRRITATION.
THE TOXICOLOGICAL PROPERTIES OF THIS SUBSTANCE HAVE NOT BEEN FULLY
INVESTIGATED. CHRONIC: NO INFORMATION FOUND. MAY CAUSE REPRODUCTIVE
AND FETAL EFFECTS. DITHIOCARBAMATE COMPOUNDS MAY CAUSE CANCER.
TARGET ORGANS: NONE.
Effects of Overexposure:SEE HEALTH HAZARDS.

=====
===== First Aid Measures =====

First Aid: EYES: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING UPPER & LOWER LIDS. GET MEDICAL AID.
SKIN: FLUSH SKIN WITH PLENTY OF SOAP & WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING & SHOES. GET MEDICAL AID IF IRRITATION DEVELOPS OR PERSISTS. INGEST: IF VICTIM IS CONSCIOUS & ALERT, GIVE 2-4 CUPFULS OF MILK OR WATER. GET MEDICAL AID IMMEDIATELY. INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL AID. NOTES TO PHYSICIAN: TREAT SYMPTOMATICALLY & SUPPORTIVELY. ANTIDOTE: NO SPECIFIC ANTIDOTE EXISTS.

=====
===== Fire Fighting Measures =====

Lower Limits: NOT AVAILABLE
Upper Limits: NOT AVAILABLE
Extinguishing Media: USE WATER SPRAY, DRY CHEMICAL OR CARBON DIOXIDE.
Fire Fighting Procedures: USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT.

=====
===== Accidental Release Measures =====

Spill Release Procedures: USE PROPER PERSONAL PROTECTIVE EQUIPMENT AS INDICATED IN SECTION 8, EXPOSURE CONTROLS, PERSONAL PROTECTION. SWEEP UP, THEN PLACE INTO A SUITABLE CONTAINER FOR DISPOSAL. AVOID GENERATING DUSTY CONDITIONS.

=====
===== Handling and Storage =====

Handling and Storage Precautions: STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE SUBSTANCES. KEEP AWAY FROM WATER.
Other Precautions: WASH THOROUGHLY AFTER HANDLING. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE. USE WITH ADEQUATE VENTILATION. MINIMIZE DUST GENERATION AND ACCUMULATION. AVOID CONTACT WITH SKIN AND EYES. KEEP CONTAINER TIGHTLY CLOSED. AVOID INGESTION AND INHALATION.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: FOLLOW THE OSHA RESPIRATOR REGULATIONS FOUND IN 29 CFR 1910.134 OR EUROPEAN STANDARD EN 149. ALWAYS USE A NIOSH OR EUROPEAN STANDARD EN 149 APPROVED RESPIRATOR WHEN NECESSARY.
Ventilation: USE ADEQUATE VENTILATION TO KEEP AIRBORNE CONCENTRATIONS LOW.
Protective Gloves: IMPERVIOUS GLOVES.
Eye Protection: ANSI APPROVED CHEMICAL WORKERS GOGGLES.
Other Protective Equipment: EYE WASH AND DELUGE SHOWER MEETING ANSI DESIGN CRITERIA. WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT SKIN EXPOSURE.
Supplemental Safety and Health
EXPOSURE LIMITS: DIETHYLCARBAMODITHIOIC ACID SODIUM SALT TRIHYDRATE:
ACGIH: NONE LISTED. NIOSH: NONE LISTED. OSHA - FINAL PELS: NONE LISTED. OSHA VACATED PELS: NO OSHA VACATED PELS ARE LISTED FOR THIS CHEMICAL. PHYSICAL DATA: MOLECULAR FORMULA: C5H10NS2NA3H2O.

===== Physical/Chemical Properties =====

Melt/Freeze Pt:=95.C, 203.F
Decomp Temp:Decomp Text:NOT AVAILABLE
Vapor Pres:NOT AVAILABLE
Vapor Density:5.9
Spec Gravity:NOT AVAILABLE
pH:NOT AVAILABLE
Viscosity:NOT AVAILABLE
Solubility in Water:SOLUBLE
Appearance and Odor:WHITE TO YELLOW SOLID; NO ODOR REPORTED.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, MOISTURE.
Stability Condition to Avoid:HIGH TEMPERATURES, INCOMPATIBLE MATERIALS,
MOISTURE. STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.
Hazardous Decomposition Products:NITROGEN OXIDES, CARBON MONOXIDE,
OXIDES OF SULFUR, CARBON DIOXIDE.

===== Toxicological Information =====

Toxicological Information:LD50/LC60: CAS #20624-25-3: ORAL, MOUSE: LD50
= 1500 MG/KG. CARCINOGENICITY: CAS #20624-25-3: NOT LISTED BY
ACGIH, IARC, NIOSH, NTP OR OSHA. EPIDEMIOLOGY: CERTAIN
DITHIOCARBAMATE COMPOUNDS HAVE BEEN REPORTED TO CAUSE ADVERSE
FETAL AND REPRODUCTIVE EFFECTS. IN ADDITION, THESE COMPOUNDS MAY
HAVE CARCINOGENIC POTENTIAL. TERATOGENICITY: NO INFO AVAILABLE.
NEUROTOXICITY: NO INFO AVAILABLE. MUTAGENICITY : PLEASE REFER TO
EZ6550000 FOR SPECIFIC INFO. OTHER STUDIES: NONE.

===== Ecological Information =====

Ecological:ECOTOXICITY: NO INFO AVAILABLE. ENVIRONMENTAL FATE: NO INFO
REPORTED. PHYSICAL/CHEMICAL: NO INFO AVAILABLE. OTHER: NONE.
--OTHER INFO: WGK (WATER DANGER/PROTECTION) - CAS #20624-25-3: 2.
CANADA - NONE OF THE CHEMS IN THIS PROD ARE LISTED ON THE DSL/NDL
LIST. THIS PROD HAS WHMIS CLASSIFICATION OF D2B. CAS #20624-25-3 IS
NOT LISTED ON CANADA'S INGREDIENT DISCLOSURE LIST.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL,
STATE AND LOCAL REGULATIONS. RCRA D-SERIES MAXIMUM CONCENTRATION OF
CONTAMINANTS: NONE LISTED. RCRA D-SERIES CHRONIC TOXICITY REFERENCE
LEVELS: NONE LISTED. RCRA F-SERIES: NONE LISTED. RCRA P-SERIES:
NONE LISTED. RCRA U-SERIES: NONE LISTED.

===== MSDS Transport Information =====

Transport Information:US DOT, IATA, RID/ADR, IMO, CANADA TDG: NO INFO
AVAILABLE.

===== Regulatory Information =====

SARA Title III Information:SECTION 302 (RQ): NONE OF THE CHEMICALS IN

THIS MATERIAL HAVE AN RQ. SECTION 302 (TPQ): NONE OF THE CHEMICALS IN THIS PRODUCT HAVE A TPQ. SARA CODES: CAS #20624-25-3: ACUTE. SECTION 313: NO CHEMICALS ARE REPORTABLE UNDER SECTION 313.

Federal Regulatory Information: CAS #20624-25-3 IS NOT ON TSCA INVENTORY. IT IS A HYDRATE & EXEMPT FROM TSCA INVENTORY REQS (40 CFR 720.3(U)(2)). HEALTH & SAFETY REPORTING LIST: NONE OF THE CHEMS ARE ON HEALTH & SAFETY REPORTING LIST. CHEM TEST RULES: NONE OF CHEMS IN PROD ARE UNDER CHEM TEST RULE. NONE OF CHEMS ARE LISTED UNDER TSCA SECTION 12B. NONE OF CHEMS IN THIS MATL HAVE SNUR UNDER TSCA. CLEAN AIR ACT: THIS MATL DOES NOT CONTAIN ANY HAZ AIR POLLUTANTS. THIS MATL DOES NOT CONTAIN ANY CLASS 1 OZONE DEPLETORS. THIS MATL DOES NOT CONTAIN ANY CLASS 2 OZONE DEPLETORS. CLEAN WATER ACT: NONE OF CHEMS IN THIS PROD ARE LISTED AS (OTHER INFO)

State Regulatory Information: CAS #20624-25-3 IS NOT PRESENT ON STATE LISTS FROM CA, PA, MN, MA, FL OR NJ. CALIFORNIA NO SIGNIFICANT RISK LEVEL: NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED.

===== Other Information =====

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Material Safety Data Sheet

Ethylenediaminetetraacetic acid (EDTA), 99%

ACC# 95399

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethylenediaminetetraacetic acid (EDTA), 99%

Catalog Numbers: AC118430000, AC118430010, AC118432500

Synonyms: Acetic acid, (ethylenedinitrilo)tetra-; 3,6-Diazaoctanedioic acid, 3,6-bis(carboxymethyl)-; Edetic acid; EDTA; EDTA (chelating agent); EDTA acid; Endrate; N,N'-1,2-Ethanediybis(N-(carboxymethyl)glycine); Ethylenediaminetetraacetic acid; Ethylenediamine-N,N,N',N'-tetraacetic acid; Ethylenedinitrilotetraacetic acid; Glycine, N,N'-1,2-ethanediybis(N-(carboxymethyl)-

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-00-4	Ethylenediaminetetraacetic acid	99	200-449-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white crystals.

Warning! Causes respiratory tract irritation. Causes eye and skin irritation. May cause kidney damage. May cause reproductive and fetal effects.

Target Organs: Kidneys, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Causes redness and pain.

Skin: Causes skin irritation. Causes redness and pain.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Ingestion of large amounts can cause hypocalcemic tetany due to formation of calcium complexes. Exposure may cause kidney injury, muscle cramps, bone-marrow depression, and a generalized allergic reaction. Ingestion of large quantities may cause appreciable

systemic toxicity involving blood chemistry changes due to chelation properties.

Inhalation: Causes irritation of the mucous membrane and upper respiratory tract.

Chronic: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause kidney damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid breathing dust.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethylenediaminetetraacetic acid	none listed	none listed	none listed

OSHA Vacated PELs: Ethylenediaminetetraacetic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: colorless to white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:220 deg C
Decomposition Temperature:240 deg C
Solubility: Slightly soluble.
Specific Gravity/Density:0.86 @ 20C
Molecular Formula:C10H16N2O8
Molecular Weight:292.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Decarboxylates above 150C.
Conditions to Avoid: Dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, aluminum, copper, copper alloys, nickel.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 60-00-4: AH4025000
LD50/LC50:
CAS# 60-00-4:
Oral, mouse: LD50 = 30 mg/kg;

Carcinogenicity:
CAS# 60-00-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: Embryo or Fetus: Stunted fetus, oral-rat TDLo=7632mg/kg. Specific developmental abnormalities: cardiovascular, craniofacial, musculoskeletal, respiratory, and urogenital, oral-rat TDLo=7632mg/kg.
Reproductive Effects: Fertility: Post-implantation mortality, oral-rat TDLo=7632mg/kg.
Mutagenicity: Cytogenetic Analysis: intraperitoneal-mouse 50mmol/L. DNA Inhibition: hamster fibroblast 500ug/L, rabbit kidney 250umol/L. EDTA leads to morphological changes of chromatin & chromosome structure in plant & animal cells. A weak induction of gene mutations has been reported.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC50 = 129-159 mg/L; 96Hr; UnspecifiedFish: Rainbow trout: LC50 = 340 mg/L; 24Hr; UnspecifiedFish: Bluegill/Sunfish: LC50 = 129-159 mg/L; 96Hr; UnspecifiedFish: Fathead Minnow: 100% Lethal = 750 ppm; 96 Hr; Static bioassayWater flea Daphnia: LC50 > 100 ppm; 96 Hr; Static bioassay If released to soil, EDTA is expected to complex with trace metals and alkaline earth metals present in the soil, thereby causing an increase in the total solubility of the metals. EDTA may eventually predominate as the Fe(III) chelate in acidic soils and as the Ca chelate in alkaline soils. Biodegradation of EDTA in aerobic soils is the dominant removal mechanism, although biodegradation in anaerobic soils is negligible. glycine. EDTA is not expected to bioaccumulate in aquatic organisms, adsorb to suspended solids or sediments or volatilize from water surfaces.

Environmental: EDTA and its chelates are expected to leach readily through soil and significant volatilization from soil is not expected. If released to water, EDTA is expected to complex with trace metals and alkaline earth metals. Biodegradation of EDTA is expected to take place relatively slowly under aerobic conditions and to be negligible under anaerobic conditions. Cometabolism has been suggested as the mechanism for EDTA biodegradation. EDTA may react with photochemically generated hydroxyl radicals (half-life 229 days) and it may photodegrade.

Physical: Compounds identified as possible biodegradation products of the ammonium ferric chelate of EDTA are as follows: ethylenediamine triacetic acid (ED3A), iminodiacetic acid (IDA), N,N-ethylenediamine diacetic acid (N,N-EDDA), N,N'-EDDA, ethylenediamine monoacetic acid (EDMA), nitrilotriacetic acid (NTA) and glycine. The following photodegradation products of Fe(III)-EDTA have been identified: carbon monoxide, formaldehyde, ED3A, N,N-EDDA, N,N'-EDDA, IDA, EDMA and glycine.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.

Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-00-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 60-00-4: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 60-00-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-00-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 60-00-4: 2

Canada - DSL/NDSL

CAS# 60-00-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

J.T. BAKER COMPANY -- FERRIC SULFATE N-HYDRATE, 2046 -- 6810-00N027348

===== **Product Identification**=====

Product ID:FERRIC SULFATE N-HYDRATE, 2046
MSDS Date:09/15/1989
FSC:6810
NIIN:00N027348
MSDS Number: BMRWQ
=== Responsible Party ===
Company Name:J.T. BAKER COMPANY
Address:222 RED SCHOOL LANE
City:PHILLIPSBURG
State:NJ
ZIP:08865-2219
Country:US
Info Phone Num:201-859-2151
Emergency Phone Num:201-859-2151
CAGE:70829
=== Contractor Identification ===
Company Name:MALLINCKRODT BAKER, INC.
Address:222 RED SCHOOL LANE
Box:City:PHILLIPSBURG
State:NJ
ZIP:08865
Country:US
Phone:800-582-2537
CAGE:70829

===== **Composition/Information on Ingredients**=====

Ingred Name:IRON (III) SULFATE; (FERRIC SULFATE)
CAS:10028-22-5
RTECS #:NO8505000
Fraction by Wt: 90-100%
OSHA PEL:1 MG/M3 (FE)
ACGIH TLV:1 MG/M3 (FE)
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

===== **Hazards Identification**=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHAL: IRRITATION OF UPPER RESPIRATORY
TRACT, IRRITATION OF MUCOUS MEMBRANES. SKIN: IRRITATION. EYE:
IRRITATION. INGEST: NAUSEA, VOMITING, GASTROINTESTINAL IRRITATION.
(CHRONIC) LIVER DAMAGE.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE IDENTIFIED.

===== **First Aid Measures**=====

First Aid:INGEST: CALL MD. IF SWALLOWED, IF CONSCIOUS, GIVE LRG AMTS OF
WATER. INDUCE VOMIT. INHAL: REMOVE TO FRESH AIR. IF NOT BRTHG, GIVE

ARTF RESP. IF BRTHG DFCLT, GIVE OXYGEN. SKIN: IMMED FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MIN WHILE REMOVING CONTAM CLTHG & SHOES. WASH CLTHG BEFORE REUSE. EYE: IMMED FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

=====
===== Fire Fighting Measures =====

Flash Point Method:CC
Extinguishing Media:USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NONE IDENTIFIED.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR SUITABLE PROTECTIVE CLOTHING. CAREFULLY SWEEP UP AND REMOVE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA. STORE IN LIGHT-RESISTANT CONTAINERS.
Other Precautions:MATERIAL IS HYGROSCOPIC. AVOID CONTACT WITH EYES, SKIN, CLOTHING. AVOID BREATHING DUST. USE WITH ADEQUATE VENTILATION. CAUSES IRRITATION. MAY BE HARMFUL IF INGESTED/INHALED.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE REQ WHERE ADEQ VENT CONDITIONS EXIST. IF AIRBORNE CONC EXCEEDS TLV, A NIOSH/MSHA APPRVD DUST/MIST RESP IS RECOMMENDED. IF CONC EXCEEDS CAPACITY OF RESP, A NIOSH/MSHA APPRVD SCBA IS ADVISED.
Ventilation:USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.
Protective Gloves:PROPER GLOVES ARE REQUIRED.
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:LAB COAT.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

=====
===== Physical/Chemical Properties =====

HCC:N1
Spec Gravity:3.10 (H*20=1)
Solubility in Water:APPRECIABLE (>10%)
Appearance and Odor:WHITE TO GRAY SOLID. ODORLESS.
Percent Volatiles by Volume:0

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
MINERAL ACIDS.
Stability Condition to Avoid:MOISTURE, LIGHT.

Hazardous Decomposition Products:OXIDES OF SULFUR.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE IN ACCORDANCE WITH ALL APPLICABLE
FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

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particular situation.

FISHER SCIENTIFIC CO CHEMICAL DIV. -- IRON(II)SULFATE, FERROUS SULFATE
HEPTAHYDRAT -- 6810-00-262-8573

=====
Product Identification
=====

Product ID: IRON(II)SULFATE, FERROUS SULFATE HEPTAHYDRAT
MSDS Date: 10/03/1989
FSC: 6810
NIIN: 00-262-8573
MSDS Number: BJKM
=== Responsible Party ===
Company Name: FISHER SCIENTIFIC CO CHEMICAL DIV.
Address: 1 REAGENT LANE
City: FAIR LAWN
State: NJ
ZIP: 07410
Country: US
Info Phone Num: 201-796-7100
Emergency Phone Num: 201-796-7100 OR 201-796-7523
CAGE: 1B464

=====
Contractor Identification
=====

Company Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address: 1 REAGENT LANE
Box: City: FAIRLAWN
State: NJ
ZIP: 07410-2802
Country: US
Phone: 201-796-7100
CAGE: 1B464

=====
Composition/Information on Ingredients
=====

Ingred Name: FERROUS SULFATE (SARA III)
CAS: 7782-63-0
RTECS #: NO8510000
Fraction by Wt: 100%
Other REC Limits: NONE SPECIFIED
OSHA PEL: 1 MG FE/M3
ACGIH TLV: 1 MG FE/M3; 9192
EPA Rpt Qty: 1000 LBS
DOT Rpt Qty: 1000 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture: LD50 (ORAL RAT) IS 1389 MG/KG
Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES
Reports of Carcinogenicity: NTP: NO IARC: NO OSHA: NO
Health Hazards Acute and Chronic: SEVERE EYE, SKIN, AND MUCOUS MEMBRANE
IRRITANT. POISONING MAY AFFECT THE DIGESTIVE TRACT, RESPIRATORY,
CARDIOVASCULAR AND CNS, LIVER, AND KIDNEYS. INHALATION: DUST/MIST
CAN CAUSE SEVERE BURNING OF RES PIRATORY TRACT. INGESTION: SEVERE
PROBLEMS INCLUDING ABDOMINAL PAIN, RETCHING, DIARRHEA, DEHYDRATION,
SHOCK.
Explanation of Carcinogenicity: NONE OF THE CHEMICALS IN THIS PRODUCT IS
LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN.
Effects of Overexposure: EYE AND SKIN BURNS DEVELOP IMMEDIATELY.
INGESTION MAY CAUSE ABDOMINAL PAIN, NAUSEA, VOMITING, HEMORRHAGING,

AND PERFORATION OF ORGANS. INHALATION OF DUST/MIST MAY CAUSE SEVERE RESPIRATORY TRACT IRRITATION, SORE THROAT, COUGH, DYSPNEA. Medical Cond Aggravated by Exposure: PERSONS WITH A HISTORY OF EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.

=====
===== First Aid Measures =====

First Aid: EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15-20 MINUTES. GET MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF VICTIM IS NOT BREATHING. INGESTION: INDUCE VOMITING WITH IPECAC SYRUP. FOLLOW WITH GASTRIC LAVAGE (DEFEROXAMINE & SODIUM BICARBONATE) UNDER MD. ADVICE

=====
===== Fire Fighting Measures =====

Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL AS APPROPRIATE FOR SURROUNDINGS.
Fire Fighting Procedures: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire/Explosion Hazard: FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS INCLUDING TOXIC SULFUR OXIDES.

=====
===== Accidental Release Measures =====

Spill Release Procedures: WEAR PROTECTIVE EQUIPMENT AND VENTILATE AREA AS REQUIRED. ABSORB SMALL SPILL WITH INERT MATERIAL (SAW DUST, SAND, OIL DRY ETC.) PLACE WASTE IN DOT APPROVED CONTAINER FOR DISPOSAL.
Neutralizing Agent: SODA ASH, LIME OR SODIUM BICARBONATE (SMALL SPILLS)

=====
===== Handling and Storage =====

Handling and Storage Precautions: STORE IN A COOL, DRY, WELL VENTILATED AREA AWAY FROM SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE. PROTECT FROM PHYSICAL DAMAGE.
Other Precautions: CORROSIVE MATERIAL - AVOID CONTACT.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL (TLV), USE NIOSH/MSHA APPROVED RESPIRATOR AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION. USE NIOSH APPROVED PARTICULATE FILTERS.
Ventilation: MECHANICAL (GENERAL) VENTILATION IS USUALLY ADEQUATE.
Protective Gloves: ACID RESISTANT GLOVES
Eye Protection: CHEMICAL SPLASH GOGGLES OR FACE SHIELD
Other Protective Equipment: SAFETY SHOWER AND EYE BATH. INDUSTRIAL TYPE WORK CLOTHING AND APRON AS REQUIRED TO AVOID PROLONGED OR REPEATED CONTACT.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR DRINKING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Safety and Health

CORROSIVE MATERIAL - AVOID CONTACT.

===== Physical/Chemical Properties =====

HCC:N1
Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES
Spec Gravity:1.898
pH:3.7
Solubility in Water:15.65%
Appearance and Odor:ODORLESS, HYGROSCOPIC, BLUE-GREEN, MONOCLINIC CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, ALKALIES, ARSENIC TRIOXIDE-SODIUM NITRATE
MIXTURE, METHYL ISOCYANOACETATE.
Stability Condition to Avoid:ALKALINE
Hazardous Decomposition Products:TOXIC AND CORROSIVE OXIDES OF SULFUR.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE
FEDERAL, STATE AND LOCAL REGULATIONS. DILUTED AND NEUTRALIZED
MATERIAL CAN PROBABLY BE FLUSHED TO WASTE WATER TREATMENT VIA A
SEWER.

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assume responsibility for the suitability of this information to their
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FISHER SCIENTIFIC -- FLORISIL -- 6810-00F000441

=====
Product Identification
=====

Product ID:FLORISIL
MSDS Date:01/01/1987
FSC:6810
NIIN:00F000441
MSDS Number: BBGQJ
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC/FAIR LAWN, NJ 07410
Emergency Phone Num:(201) 796-7100
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:MAGNESIUM SILICATE
CAS:1343-90-4
RTECS #:OM4360000
Fraction by Wt: 100%

=====
Hazards Identification
=====

Effects of Overexposure:REPEATED OR PROLONGED SKIN CONTACT MAY CAUSE
DERMATITIS/IRRITATION/CONJUNCTIVITIS.

=====
First Aid Measures
=====

First Aid:INHALATION: REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED,
GIVE ARTIFICIAL RESP/OXYGEN. SKIN: REMOVE CONTAMINATED
CLOTHING/SHOES. WASH AFFECTED AREA W/SOAP, MILD DETERGENT/WATER.
INGESTION: GIVE 2-4 O F WATER. INDUCE VOMITING. GET MEDICAL
ATTENTION.

=====
Fire Fighting Measures
=====

Flash Point:NON-FLAMMABLE
Extinguishing Media:DRY CHEMICAL, CO2, WATER SPRAY OR FOAM
Fire Fighting Procedures:AVOID BREATHING VAPORS OR DUSTS. SCBA W/A
FULL FACEPIECE.
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE/EXPLOSION HAZARD WHEN
EXPOSED TO HEAT OR FLAME.

=====
Accidental Release Measures
=====

Spill Release Procedures:NO SPECIAL PRECAUTIONS INDICATED.

=====
Exposure Controls/Personal Protection
=====

Ventilation:PROVIDE LOCAL EXHAUST VENTILATION TO KEEP BELOW TLV
Protective Gloves:RUBBER
Eye Protection:SAFETY GOGGLES
Other Protective Equipment:AVOID REPEATED OR PROLONGED CONTACT WITH
THIS SUBSTANCE.
Supplemental Safety and Health
MSDS DATE: 20 FEB 85. MOL WT: 806.3

===== Physical/Chemical Properties =====

Spec Gravity:2.5
Solubility in Water:SLIGHTLY
Appearance and Odor:WHITE/HARD/GRANULAR/POWDERED MAGNESIUM SILICATE.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

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FISHER SCIENTIFIC, CHEMICAL DIV. -- GELATIN, G8500 -- 6505-01-185-3292

=====
Product Identification
=====

Product ID:GELATIN, G8500
MSDS Date:03/28/1991
FSC:6505
NIIN:01-185-3292
MSDS Number: BPHSP
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100 (GASTON L. PILLORI)
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:GELATIN
CAS:9000-70-8
RTECS #:LX8580000
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED

=====
Hazards Identification
=====

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: INHALE-MAY PRODUCE IRRITATION.
EYE-MAY BE MILD IRRITATION FROM DUST. INGESTION-NO KNOWN EFFECTS.
CHRONIC: INHALE-MAY CAUSE MUCOUS MEMBRANE IRRITATION.EYE-MAY CAUSE
IRRITATION. INGEST-NO KNOWN E FFECTS.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:INAHALTION-COUGHING. EYE-REDNESS FROM DUST.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:INHALE-REMOVE TO FRESH AIR, GIVE SUPPORT BREATHING IF NEEDED,
KEEP WARM & AT REST. SKIN-REMOVE CONTAMINATED CLTHG. WASH SKIN WITH
SOAP & WATER FOR AT LEAST 15 MIN. EYE-WASH WITH WATER FOR AT LEAST
15 MIN WHILE LIFTING EYELIDS. INGESTION-NOT APPLICABLE. GELATIN IS
AN ACCEPTED FOOD PRODUCT. FOR ABOVE EXPOSURES, GET MEDICAL
ATTENTION IMMEDIATELY.

=====
===== Fire Fighting Measures =====

Extinguishing Media: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR REGULAR FOAM. FOR LARGE FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM.

Fire Fighting Procedures: NO ACUTE HAZARD. MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. AVOID BREATHING VAPORS OR DUSTS; KEEP UPWIND.

Unusual Fire/Explosion Hazard: NEGLIGIBLE FIRE/EXPLOSION HAZARD IN DUST FORM WHEN EXPOSED TO HEAT & FLAME.

=====
===== Accidental Release Measures =====

Spill Release Procedures: SWEEP UP AND PLACE IN A SUITABLE CONTAINER (FIBERBOARD) FOR RECLAMATION OR LATER DISPOSAL.

=====
===== Handling and Storage =====

Handling and Storage Precautions: NONE SPECIFIED BY MANUFACTURER.

Other Precautions: AVOID REPEATED OR PROLONGED CONTACT WITH THIS SUBSTANCE. DO NOT WEAR CONTACT LENSES WHEN WORKING WITH CHEMICALS.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: ANY DUST & MIST RESPIRATOR WITH A FULL FACEPIECE. ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER. ANY POWDERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACE PICE.

Ventilation: PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION SYSTEM.

Protective Gloves: NOT REQUIRED BUT RECOMMENDED.

Eye Protection: NOT REQUIRED BUT ADVISABLE.

Other Protective Equipment: PROTECTIVE CLOTHING NOT REQUIRED, BUT ADVISABLE.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

=====
===== Physical/Chemical Properties =====

HCC: N1

Spec Gravity: 0.68 (H2O=1)

pH: 6±6

Solubility in Water: SOLUBLE IN WARM H2O

Appearance and Odor: COLORLESS OR YELLOW, TRANSPARENT, BRITTLE, ODORLESS, TASTELESS, SHEETS, FLAKES, POWDE

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES

NO DATA AVAILABLE.

Stability Condition to Avoid: STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY RELEASE TOXIC AND/OR HAZARDOUS GASES.

=====
===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL,
STATE & LOCAL REGULATIONS.

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particular situation.

FISHER SCIENTIFIC CHEMICAL DIV -- GLYCERINE 10440 G31 1 -- 6850-00F053639

=====
Product Identification
=====

Product ID:GLYCERINE 10440 G31 1
MSDS Date:01/11/1995
FSC:6850
NIIN:00F053639
MSDS Number: CFJMR
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC CHEMICAL DIV
Address:1 REAGENT LN
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100/201-796-7523
Emergency Phone Num:201-796-7100/201-796-7523
CAGE:1B464

==== Contractor Identification ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:GLYCERINE, 1,2,3,-TRIHIDROXYPROPANE, GLYCEROL, ANHYDROUS
GLYCERINE, GLYCERIN *97-1*
CAS:56-81-5
RTECS #:MA8050000
Fraction by Wt: 100%
ACGIH TLV:10 MG/CUM (VAPOR)

=====
Hazards Identification
=====

LD50 LC50 Mixture:ORAL LD50(RAT): 12,600 MG/KG GLYCERINE
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYES/SKIN: MAY CAUSE IRRITATION.
INGESTION: GASTROINTESTINAL IRRITANT. INHALATION: RESPIRATORY
IRRITANT. MAY CAUSE KIDNEY INJURY.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION, NAUSEA, VOMITING, DIARRHEA,
HEADACHE

=====
First Aid Measures
=====

First Aid:EYES: FLUSH W/PLENTY OF WATER FOR 15 MINS. SKIN: FLUSH
W/PLENTY OF SOAP & WATER FOR 15 MINS. INGESTION: IF CONSCIOUS &
ALERT, GIVE 2-4 CUPFULS OF MILK/WATER. NEVER GIVE ANYTHING BY MOUTH
IF UNCONSCIOUS. INHALATION: REMOVE TO FRESH AIR IMMEDIATELY. GIVE
CPR/OXYGEN IF NECESSARY. TREAT SYMPTOMATICALLY & SUPPORTIVELY.

OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
===== Fire Fighting Measures =====

Flash Point:379.4F
Lower Limits:1.1
Extinguishing Media:WATER, DRY CHEMICAL, CHEMICAL
FOAM/ALCOHOL-RESISTANT FOAM
Fire Fighting Procedures:WEAR A SELF CONTAINED BREATHING APPARATUS IN
PRESSURE-DEMAND, MSHA/NIOSH APPROVED & FULL PROTECTIVE GEAR. USE
WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.
Unusual Fire/Explosion Hazard:AUTOIGNITION TEMP: 752F.

=====
===== Accidental Release Measures =====

Spill Release Procedures:ABSORB W/INERT MATERIAL, DRY SAND/EARTH. THEN
PLACE INTO CHEMICAL WASTE CONTAINER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY, WELL VENTILATED
AREA AWAY FROM INCOMPATIBLE SUBSTANCES. USE W/ADEQUATE VENTILATION.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE A NIOSH APPROVED REPIRATOR WHEN NECESSARY.
Ventilation:GOOD GENERAL VENTILATION SHOULD BE SUFFICIENT TO CONTROL
AIRBORNE LEVELS.
Protective Gloves:REQUIRED
Eye Protection:CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment:PROTECTIVE CLOTHING
Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE. WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
INCOMPATIBILITIES CONT'D: PERCHLORIC ACID, LEAD OXIDES.

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:554F
Melt/Freeze Pt:M.P/F.P Text:20F
Decomp Temp:Decomp Text:554F
Vapor Pres:0.0025
Vapor Density:3.17
Spec Gravity:1.4746
Solubility in Water:MISCIBLE
Appearance and Odor:CLEAR VISCOUS LIQUID W/BLAND ODOR

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS, HYDROGEN PEROXIDE, POTASSIUM PERMANGANATE, CALCIUM
HYPOCHLORITE, NITRIC ACID, SULFURIC ACID (SEE SUPP)
Stability Condition to Avoid:EXCESSIVE HEAT, OTHER IGNITION SOURCES
Hazardous Decomposition Products:CO, CO2

=====
===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE &
FEDERAL REGULATIONS.

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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Glycine

ACC# 10490

Section 1 - Chemical Product and Company Identification

MSDS Name: Glycine

Catalog Numbers: S80028, S93253, BP381-1, BP381-5, BP381-500, G45-12, G45-212, G4512LC, G46-1, G46-12KG, G46-500, G48-12, G48-200LB, G48-212, G48-500

Synonyms: Aminoacetic acid; Aminoethanoic acid; Gly.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-40-6	Glycine	>98	200-272-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Caution! May be absorbed through intact skin. May cause eye and skin irritation. May cause respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling. May be absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.
Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Glycine	none listed	none listed	none listed

OSHA Vacated PELs: Glycine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 4.0 (1.4% sol.)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 232 - 236 deg C

Decomposition Temperature: 232 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.1607 (water=1)

Molecular Formula:C2H5NO2

Molecular Weight:75.07

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 56-40-6: MB7600000

LD50/LC50:

CAS# 56-40-6:

Oral, mouse: LD50 = 4920 mg/kg;

Oral, rat: LD50 = 7930 mg/kg;

Glycine is a non-essential amino acid for human development. It is the only amino acid with no asymmetric carbon.

Carcinogenicity:

CAS# 56-40-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: Major inhibitory neurotransmitter.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-40-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-40-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 22 Do not breathe dust.

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 56-40-6: 0

Canada - DSL/NDSL

CAS# 56-40-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ethylenediaminetetraacetic acid, reagent ACS

ACC# 95404

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethylenediaminetetraacetic acid, reagent ACS

Catalog Numbers: AC409930000, AC409930010, AC409930050

Synonyms: Acetic acid, (ethylenedinitrilo)tetra-; 3,6-Diazaoctanedioic acid, 3,6-bis(carboxymethyl)-; Edetic acid; EDTA; EDTA (chelating agent); EDTA acid; Endrate; N,N'-1,2-Ethanediybis(N-(carboxymethyl)glycine); Ethylenediaminetetraacetic acid; Ethylenediamine

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-00-4	Ethylenediaminetetraacetic acid	>99	200-449-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white crystals.

Warning! Causes respiratory tract irritation. Causes eye and skin irritation. May cause kidney damage. May cause reproductive and fetal effects.

Target Organs: Kidneys, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Causes redness and pain.

Skin: Causes skin irritation. Causes redness and pain.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts can cause hypocalcemic tetany due to formation of calcium complexes. Exposure may cause kidney injury, muscle cramps, bone-marrow depression, and a generalized allergic reaction. Ingestion of large quantities may cause appreciable systemic toxicity involving blood chemistry changes due to chelation properties.

Inhalation: Causes irritation of the mucous membrane and upper respiratory tract.

Chronic: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause kidney damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid breathing dust.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethylenediaminetetraacetic acid	none listed	none listed	none listed

OSHA Vacated PELs: Ethylenediaminetetraacetic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: colorless to white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 220 deg C

Decomposition Temperature:240 deg C

Solubility: Slightly soluble.

Specific Gravity/Density:0.86 @ 20C

Molecular Formula:C10H16N2O8

Molecular Weight:292.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Decarboxylates above 150C.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, aluminum, copper, copper alloys, nickel.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 60-00-4: AH4025000

LD50/LC50:

CAS# 60-00-4:

Oral, mouse: LD50 = 30 mg/kg;

Carcinogenicity:

CAS# 60-00-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Embryo or Fetus: Stunted fetus, oral-rat TDLo=7632mg/kg. Specific developmental abnormalities: cardiovascular, craniofacial, musculoskeletal, respiratory, and urogenital, oral-rat TDLo=7632mg/kg.

Reproductive Effects: Fertility: Post-implantation mortality, oral-rat TDLo=7632mg/kg.

Mutagenicity: Cytogenetic Analysis: intraperitoneal-mouse 50mmol/L. DNA Inhibition: hamster fibroblast 500ug/L, rabbit kidney 250umol/L. EDTA leads to morphological changes of chromatin & chromosome structure in plant & animal cells. A weak induction of gene mutations has been reported.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC50 = 129-159 mg/L; 96Hr; UnspecifiedFish: Rainbow trout: LC50 = 340 mg/L; 24Hr; UnspecifiedFish: Bluegill/Sunfish: LC50 = 129-159 mg/L; 96Hr; UnspecifiedFish: Fathead Minnow: 100% Lethal = 750 ppm; 96 Hr; Static bioassay
Water flea Daphnia: LC50 > 100 ppm; 96 Hr; Static bioassay
If released to soil, EDTA is expected to complex with trace metals and alkaline earth metals present in the soil, thereby causing an increase in the total solubility of the metals. EDTA may eventually predominate as the Fe(III) chelate in acidic soils and as the Ca chelate in alkaline soils. Biodegradation of EDTA in aerobic soils is the dominant removal mechanism, although biodegradation in anaerobic soils is negligible. glycine. EDTA is not expected to bioaccumulate in aquatic organisms, adsorb to suspended solids or sediments or volatilize from water surfaces.

Environmental: EDTA and its chelates are expected to leach readily through soil and significant volatilization from soil is not expected. If released to water, EDTA is expected to complex with trace metals and alkaline earth metals. Biodegradation of EDTA is expected to take place relatively slowly under aerobic conditions and to be negligible under anaerobic conditions. Cometabolism has been suggested as the mechanism for EDTA biodegradation. EDTA may react with photochemically generated hydroxyl radicals (half-life 229 days) and it may photodegrade.

Physical: Compounds identified as possible biodegradation products of the ammonium ferric chelate of EDTA are as follows: ethylenediamine triacetic acid (ED3A), iminodiacetic acid (IDA), N,N-ethylenediamine diacetic acid (N,N-EDDA), N,N'-EDDA, ethylenediamine monoacetic acid (EDMA), nitrilotriacetic acid (NTA) and glycine. The following photodegradation products of Fe(III)-EDTA have been identified: carbon monoxide, formaldehyde, ED3A, N,N-EDDA, N,N'-EDDA, IDA, EDMA and glycine.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-00-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 60-00-4: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 60-00-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-00-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 60-00-4: 2

Canada - DSL/NDSL

CAS# 60-00-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Fast garnet gbc base, 97%

ACC# 91505

Section 1 - Chemical Product and Company Identification

MSDS Name: Fast garnet gbc base, 97%

Catalog Numbers: AC153260000, AC153260250, AC153261000

Synonyms: 2-Aminoazotoluene; 4'-Amino-2,3'-dimethylazobenzene; C.I. 11160; Solvent Yellow 3

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
97-56-3	O-Aminoazotoluene	97	202-591-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-brown crystalline powder.

Caution! May cause allergic skin reaction. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Potential cancer hazard. This product contains o-Aminoazotoluene, a chemical known to the state of California to cause cancer.

Target Organs: Skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause sensitization by skin contact.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Potential cancer hazard.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid

contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
O-Aminoazotoluene	none listed	none listed	none listed

OSHA Vacated PELs: O-Aminoazotoluene: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: red-brown

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 101.00 - 102.00 deg C

Decomposition Temperature: Not available.

Solubility: 7.64 mg/L @ 25°C

Specific Gravity/Density: Not available.

Molecular Formula: C₁₄H₁₅N₃

Molecular Weight: 225.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 97-56-3: XU8800000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 97-56-3:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

Epidemiology: IARC Group 2B: No data available on human carcinogenicity, however sufficient evidence of carcinogenicity in animals.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: This substance has low mobility in soil and is not expected to volatilize from moist soil surfaces. May bioconcentrate in aquatic organisms and may adsorb to suspended solids and sediment in the water. May react rapidly with hydroxyl radicals in the atmosphere.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 97-56-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

This material contains O-Aminoazotoluene (CAS# 97-56-3, 97%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 97-56-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains O-Aminoazotoluene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 97-56-3: 0.2 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 43 May cause sensitization by skin contact.

R 45 May cause cancer.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 97-56-3: No information available.

Canada - DSL/NDSL

CAS# 97-56-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 97-56-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Fast Green FCF, High Purity Biological Stain

ACC# 95265

Section 1 - Chemical Product and Company Identification

MSDS Name: Fast Green FCF, High Purity Biological Stain

Catalog Numbers: AC229740000, AC229740250

Synonyms: Food Green 3; Aizen Food Green No. 3; C.I. 42053; FD and C Green No. 3; Solid Green FCF; 1724 Green

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
2353-45-9	Fast Green FCF	ca 100	219-091-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: Dust is irritating to the respiratory tract. May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Fast Green FCF	none listed	none listed	none listed

OSHA Vacated PELs: Fast Green FCF: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Decomposes.

Decomposition Temperature: 290 deg C

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula:C37H36N2O10S3.2Na

Molecular Weight:810.419

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, irritating and toxic fumes and gases, carbon dioxide, sulfur oxides (SOx), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 2353-45-9: BQ4425000

LD50/LC50:

CAS# 2353-45-9:

Oral, rat: LD50 = >2 gm/kg;

Carcinogenicity:

CAS# 2353-45-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: IARC Group 3: Suspected animal carcinogenic substance of potential relevance to humans. IARC Group 3: Limited or insufficient evidence for carcinogenicity in both animals and humans.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 2353-45-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 2353-45-9: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 2353-45-9 can be found on the following state right to know lists: California.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

S 25 Avoid contact with eyes.

S 37 Wear suitable gloves.

S 37/39 Wear suitable gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 2353-45-9: No information available.

Canada - DSL/NDSL

CAS# 2353-45-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ferric Sulfate Monohydrate

ACC# 45419

Section 1 - Chemical Product and Company Identification

MSDS Name: Ferric Sulfate Monohydrate

Catalog Numbers: S80013, S93243

Synonyms: Diiron Trisulfate; Ferric Sulfate; Iron Persulfate; Iron Sesquisulfate; Iron Sulfate (2:3); Iron (3+) Sulfate; Sulfuric Acid, Iron

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10028-22-5	Ferric sulfate, monohydrate	100	233-072-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow-gray solid.

Caution! May cause respiratory tract irritation. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. May cause liver and kidney damage.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause liver and kidney damage.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Discard contaminated shoes.
Storage: Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ferric sulfate, monohydrate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Ferric sulfate, monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow-gray

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: Decomposes.

Decomposition Temperature: 480 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 3.097

Molecular Formula: Fe₂(SO₄)₃.H₂O

Molecular Weight: 399.8668

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Corrosive to metals.

Hazardous Decomposition Products: Sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 10028-22-5: NO8505000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10028-22-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	No information available.
Hazard Class:	8	
UN Number:	UN3260	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10028-22-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10028-22-5: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10028-22-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10028-22-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 10028-22-5: 1

Canada - DSL/NDSL

CAS# 10028-22-5 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10028-22-5 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC CO CHEMICAL DIV. -- IRON(II)SULFATE, FERROUS SULFATE
HEPTAHYDRAT -- 6810-00-262-8573

=====
Product Identification
=====

Product ID: IRON(II)SULFATE, FERROUS SULFATE HEPTAHYDRAT
MSDS Date: 10/03/1989
FSC: 6810
NIIN: 00-262-8573
MSDS Number: BJKM
=== Responsible Party ===
Company Name: FISHER SCIENTIFIC CO CHEMICAL DIV.
Address: 1 REAGENT LANE
City: FAIR LAWN
State: NJ
ZIP: 07410
Country: US
Info Phone Num: 201-796-7100
Emergency Phone Num: 201-796-7100 OR 201-796-7523
CAGE: 1B464

=====
Contractor Identification
=====

Company Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address: 1 REAGENT LANE
Box: City: FAIRLAWN
State: NJ
ZIP: 07410-2802
Country: US
Phone: 201-796-7100
CAGE: 1B464

=====
Composition/Information on Ingredients
=====

Ingred Name: FERROUS SULFATE (SARA III)
CAS: 7782-63-0
RTECS #: NO8510000
Fraction by Wt: 100%
Other REC Limits: NONE SPECIFIED
OSHA PEL: 1 MG FE/M3
ACGIH TLV: 1 MG FE/M3; 9192
EPA Rpt Qty: 1000 LBS
DOT Rpt Qty: 1000 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture: LD50 (ORAL RAT) IS 1389 MG/KG
Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES
Reports of Carcinogenicity: NTP: NO IARC: NO OSHA: NO
Health Hazards Acute and Chronic: SEVERE EYE, SKIN, AND MUCOUS MEMBRANE
IRRITANT. POISONING MAY AFFECT THE DIGESTIVE TRACT, RESPIRATORY,
CARDIOVASCULAR AND CNS, LIVER, AND KIDNEYS. INHALATION: DUST/MIST
CAN CAUSE SEVERE BURNING OF RES PIRATORY TRACT. INGESTION: SEVERE
PROBLEMS INCLUDING ABDOMINAL PAIN, RETCHING, DIARRHEA, DEHYDRATION,
SHOCK.
Explanation of Carcinogenicity: NONE OF THE CHEMICALS IN THIS PRODUCT IS
LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN.
Effects of Overexposure: EYE AND SKIN BURNS DEVELOP IMMEDIATELY.
INGESTION MAY CAUSE ABDOMINAL PAIN, NAUSEA, VOMITING, HEMORRHAGING,

AND PERFORATION OF ORGANS. INHALATION OF DUST/MIST MAY CAUSE SEVERE RESPIRATORY TRACT IRRITATION, SORE THROAT, COUGH, DYSPNEA. Medical Cond Aggravated by Exposure: PERSONS WITH A HISTORY OF EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.

=====
===== First Aid Measures =====

First Aid: EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15-20 MINUTES. GET MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF VICTIM IS NOT BREATHING. INGESTION: INDUCE VOMITING WITH IPECAC SYRUP. FOLLOW WITH GASTRIC LAVAGE (DEFEROXAMINE & SODIUM BICARBONATE) UNDER MD. ADVICE

=====
===== Fire Fighting Measures =====

Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL AS APPROPRIATE FOR SURROUNDINGS.
Fire Fighting Procedures: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire/Explosion Hazard: FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS INCLUDING TOXIC SULFUR OXIDES.

=====
===== Accidental Release Measures =====

Spill Release Procedures: WEAR PROTECTIVE EQUIPMENT AND VENTILATE AREA AS REQUIRED. ABSORB SMALL SPILL WITH INERT MATERIAL (SAW DUST, SAND, OIL DRY ETC.) PLACE WASTE IN DOT APPROVED CONTAINER FOR DISPOSAL.
Neutralizing Agent: SODA ASH, LIME OR SODIUM BICARBONATE (SMALL SPILLS)

=====
===== Handling and Storage =====

Handling and Storage Precautions: STORE IN A COOL, DRY, WELL VENTILATED AREA AWAY FROM SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE. PROTECT FROM PHYSICAL DAMAGE.
Other Precautions: CORROSIVE MATERIAL - AVOID CONTACT.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL (TLV), USE NIOSH/MSHA APPROVED RESPIRATOR AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION. USE NIOSH APPROVED PARTICULATE FILTERS.
Ventilation: MECHANICAL (GENERAL) VENTILATION IS USUALLY ADEQUATE.
Protective Gloves: ACID RESISTANT GLOVES
Eye Protection: CHEMICAL SPLASH GOGGLES OR FACE SHIELD
Other Protective Equipment: SAFETY SHOWER AND EYE BATH. INDUSTRIAL TYPE WORK CLOTHING AND APRON AS REQUIRED TO AVOID PROLONGED OR REPEATED CONTACT.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR DRINKING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Safety and Health

CORROSIVE MATERIAL - AVOID CONTACT.

===== Physical/Chemical Properties =====

HCC:N1
Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES
Spec Gravity:1.898
pH:3.7
Solubility in Water:15.65%
Appearance and Odor:ODORLESS, HYGROSCOPIC, BLUE-GREEN, MONOCLINIC CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, ALKALIES, ARSENIC TRIOXIDE-SODIUM NITRATE
MIXTURE, METHYL ISOCYANOACETATE.
Stability Condition to Avoid:ALKALINE
Hazardous Decomposition Products:TOXIC AND CORROSIVE OXIDES OF SULFUR.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE
FEDERAL, STATE AND LOCAL REGULATIONS. DILUTED AND NEUTRALIZED
MATERIAL CAN PROBABLY BE FLUSHED TO WASTE WATER TREATMENT VIA A
SEWER.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Florisil

ACC# 91725

Section 1 - Chemical Product and Company Identification

MSDS Name: Florisil

Catalog Numbers: 1113113, 1113114, 1113115, 1113116

Synonyms: None Known.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1343-88-0	Magnesium Silicate Hydrate	ca. 100	215-681-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium Silicate Hydrate	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium Silicate Hydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: Not available.
Specific Gravity/Density:2.510
Molecular Formula:Not applicable.
Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide, oxides of manganese, oxides of silicon.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 1343-88-0 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 1343-88-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1343-88-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1343-88-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1343-88-0: 0

Canada - DSL/NDSL

CAS# 1343-88-0 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

D-Galactose, 98% (HPLC)

ACC# 00654

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Galactose, 98% (HPLC)

Catalog Numbers: AC410840000, AC410841000, AC410845000

Synonyms: D-Galactopyranose

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
59-23-4	D-Galactose	ca. 100%	200-416-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This substance has caused adverse reproductive and fetal effects in animals. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Galactose	none listed	none listed	none listed

OSHA Vacated PELs: D-Galactose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: 6.2

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 167 deg C

Decomposition Temperature: Not available.

Solubility: 680 g/l (25 C) in water.

Specific Gravity/Density: Not available.

Molecular Formula:C6H12O6

Molecular Weight:180.0804

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 59-23-4: LW5490000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 59-23-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Effects on Newborn: Germ cell effects, oral-rat TDLo=1000g/kg; Growth Statistics, oral-rat TDLo=440g/kg; Live birth index, oral-mouse TDLo=165g/kg. Embryo or fetus, oral-rat TDLo=240g/kg.

Reproductive Effects: Fertility: Abortion, oral-mouse TDLo=1260g/kg.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 59-23-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 59-23-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 59-23-4: 0

Canada - DSL/NDSL

CAS# 59-23-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Gelatin

ACC# 10345

Section 1 - Chemical Product and Company Identification

MSDS Name: Gelatin

Catalog Numbers: AC611995000, G7-3, G7-500, G8-500

Synonyms: Absorbable Gelatin Sponge; Gelatine; Pharmagel.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9000-70-8	GELATIN	100	232-554-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to pale yellow solid.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Intraperitoneal injection has resulted in fetal effects.

Ingestion: Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation.

Chronic: Intraperitoneal injection has resulted in fetal effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes.

Extinguishing Media: Use water spray, dry chemical, or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and

inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
GELATIN	none listed	none listed	none listed

OSHA Vacated PELs: GELATIN: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to pale yellow

Odor: none reported

pH: 6.0 (6% solution)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 0.68 (water=1)

Molecular Formula: Varies

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizers.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9000-70-8: LX8580000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 9000-70-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Effects on Newborn: Reduced weight gain, intraperitoneal mouse TDLo=700mg/kg. Specific Developmental Abnormalities: Urogenital; intraperitoneal mouse TDLo=700mg/kg.

Reproductive Effects: No information available.

Mutagenicity: Please refer to RTECS# LX8580000 for specific information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9000-70-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9000-70-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 9000-70-8: 0

Canada - DSL/NDSL

CAS# 9000-70-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Guar gum

ACC# 89758

Section 1 - Chemical Product and Company Identification

MSDS Name: Guar gum

Catalog Numbers: S76773, S76774

Synonyms: Guaran; Indalca AG; Jaguar.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9000-30-0	Guar gum	100.0	232-536-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellowish-white powder.

Caution! Repeated inhalation of dust can cause sensitization to susceptible individuals. May cause allergic skin reaction. May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: Respiratory system, skin.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May cause sensitization by skin contact.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Inhalation of dust may cause respiratory tract irritation. May cause respiratory sensitization.
Chronic: Some individuals may develop a respiratory allergenic response to guar dust. Persons with a history of respiratory allergies may have those conditions aggravated by exposure to guar dust.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Guar gum	none listed	none listed	none listed

OSHA Vacated PELs: Guar gum: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellowish-white

Odor: Not available.

pH: 5.5-6.2 (1% solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density:Not available.

Molecular Formula:Not available.

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: None reported.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, acrid smoke and fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9000-30-0: MG0185000

LD50/LC50:

CAS# 9000-30-0:

Oral, mouse: LD50 = 8100 mg/kg;

Oral, rabbit: LD50 = 7 gm/kg;

Oral, rat: LD50 = 6770 mg/kg;

Carcinogenicity:

CAS# 9000-30-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9000-30-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9000-30-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 9000-30-0: 0

Canada - DSL/NDSL

CAS# 9000-30-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

D-Glucose-1-Phosphate Disodium Salt Tetrahydrate

ACC# 08226

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Glucose-1-Phosphate Disodium Salt Tetrahydrate

Catalog Numbers: S74566

Synonyms: 17364-14-6 is for the anhydrous sodium salt (C₆H₁₃O₉P.xNa), not the tetrahydrate. 56401-20-8 is for the anhydrous disodium salt of alpha-d-glucopyranose, 1-(dihydrogen phosphate). 32972-46-6 is also for the anhydrous disodium salt. There is no alpha designation in this name.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56401-20-8	α-D-Glucopyranose, 1-(dihydrogenphosphate), disodium	100	260-154-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: not available solid.

Caution! May cause eye and skin irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: No information found. The toxicological properties of this substance have not been fully investigated.

Inhalation: No information available. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: No specific antidote exists. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
a-D-Glucopyranose, 1-(dihydrogenphosphate), disodium	none listed	none listed	none listed
D-Glucopyranose, 1-(dihydrogen phosphate), sodium salt	none listed	none listed	none listed
d-Glucopyranose, 1-(dihydrogen phosphate), disodium salt	none listed	none listed	none listed

OSHA Vacated PELs: a-D-Glucopyranose, 1-(dihydrogenphosphate), disodium: No OSHA Vacated PELs are listed for this chemical. D-Glucopyranose, 1-(dihydrogen phosphate), sodium salt: No OSHA Vacated PELs are listed for this chemical. d-Glucopyranose, 1-(dihydrogen phosphate), disodium salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: not available

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.
Vapor Density: Not applicable.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not applicable.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: C₆H₁₁O₉PNa₂·4H₂O
Molecular Weight: 304.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: No data available.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 56401-20-8 unlisted.

CAS# 17364-14-6 unlisted.

CAS# 32972-46-6 unlisted.

LD50/LC50:

Not available.

Not available.

Not available.

Carcinogenicity:

CAS# 56401-20-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 17364-14-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 32972-46-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Please refer to RTECS for specific information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56401-20-8 is not listed on the TSCA inventory. It is for research and development use only.

CAS# 17364-14-6 is listed on the TSCA inventory.

CAS# 32972-46-6 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56401-20-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 17364-14-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 32972-46-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 56401-20-8: No information available.

CAS# 17364-14-6: No information available.

CAS# 32972-46-6: No information available.

Canada - DSL/NDSL

CAS# 17364-14-6 is listed on Canada's NDSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

FISHER SCIENTIFIC CHEMICAL DIV -- BP229 1 GLYCERINE -- 6810-00F051788

=====
Product Identification
=====

Product ID:BP229 1 GLYCERINE
MSDS Date:01/11/1995
FSC:6810
NIIN:00F051788
MSDS Number: CCFTB
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC CHEMICAL DIV
Address:1 REAGENT LN
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100/201-796-7523
Emergency Phone Num:201-796-7100/201-796-7523
CAGE:1B464

==== Contractor Identification ====
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:GLYCERINE, 1,2,3,-TRIHIDROXYPROPANE, GLYCEROL, ANHYDROUS
GLYCERINE, GLYCERIN *96-3*
CAS:56-81-5
RTECS #:MA8050000
Fraction by Wt: 100%
ACGIH TLV:10 MG/CUM (VAPOR)

=====
Hazards Identification
=====

LD50 LC50 Mixture:ORAL LD50 (RAT): 12600 MG/KG
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYES/SKIN: IRRITATION. INGESTION: MAY
CAUSE GASTROINTESTINAL IRRITATION. INHALATION: MAY CAUSE
RESPIRATORY TRACT IRRITATION. MAY CAUSE KIDNEY INJURY.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION, NAUSEA, VOMITING, DIARRHEA.

=====
First Aid Measures
=====

First Aid:EYES: FLUSH W/PLENTY OF WATER FOR 15 MINS. SKIN: FLUSH
W/PLENTY OF SOAP & WATER FOR 15 MINS. INGESTION: IF CONSCIOUS &
ALERT, GIVE 4 CUPS OF MOLK/WATER. NEVER GIVE ANYTHING BY MOUTH TO
AN UNCONSCIOUS PERSON. INHALATION: REMOVE FROM AREA. IF NOT
BREATHING GIVE CPR. IF BREATHING IS DIFFICULT, GIVE OXYGEN. OBTAIN
MEDICAL ATTENTION IN ALL CASES.

=====
===== Fire Fighting Measures =====

Flash Point:379.4F
Lower Limits:1.1
Extinguishing Media:WATER, DRY CHEMICAL, CHEMICAL FOAM/ALCOHOL
RESISTANT FOAM.
Fire Fighting Procedures:WEAR SCBA, PRESSURE-DEMAND, MSHA/NIOSH
APPROVED & FULL PROTECTIVE GEAR.
Unusual Fire/Explosion Hazard:AUTOIGNITION: 752F

=====
===== Accidental Release Measures =====

Spill Release Procedures:ABSORB W/INERT MATERIAL SUCH AS DRY
SAND/EARTH, THEN PLACE INTO A CHEMICAL WASTE CONTAINER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:WASH THOROUGHLY AFTER HANDLING. STORE
IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE
SUBSTANCES.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH APPROVED RESPIRATOR WHEN NECESSARY.
Ventilation:GOOD GENERAL VENTILATION SHOULD BE SUFFICIENT TO CONTROL
AIRBORNE LEVELS.
Protective Gloves:APPROPRIATE
Eye Protection:CHEMICAL GOGGLES & FACESHIELD
Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING/SHOES
BEFORE REUSE.
Supplemental Safety and Health
MATS TO AVOID: SULFURIC ACID, PERCHLORIC ACID & LEAD OXIDE.

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:554F
Melt/Freeze Pt:M.P/F.P Text:20F
Vapor Pres:0.0025
Vapor Density:3.17
Spec Gravity:1.4746
Solubility in Water:MISCIBLE
Appearance and Odor:CLEAR VISCOUS LIQUID W/BLAND ODOR.

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS, MIXTURES W/HYDROGEN PEROXIDE, POTASSIUM
PERMANGANATE/CALCIUM HYPOCHLORITE, NITRIC ACID. (SUPP)
Stability Condition to Avoid:IGNITION SOURCES & EXCESS HEAT.
Hazardous Decomposition Products:CO, CO2.

=====
===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IAW/FEDERAL, STATE & LOCAL
REGULATIONS.

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Material Safety Data Sheet

Glycine, 98%

ACC# 96131

Section 1 - Chemical Product and Company Identification

MSDS Name: Glycine, 98%

Catalog Numbers: AC120070000, AC120070010, AC120070050, 12007-2500

Synonyms: Aminoacetic acid; Aminoethanoic acid; Gly.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-40-6	Glycine	98	200-272-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Caution! May be absorbed through intact skin. May cause eye and skin irritation. May cause respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling. May be absorbed through the skin.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.
Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Glycine	none listed	none listed	none listed

OSHA Vacated PELs: Glycine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 4.0 (1.4% sol.)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 232-236 deg C (dec)

Decomposition Temperature: 232 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.1607 (water=1)

Molecular Formula:C2H5NO2

Molecular Weight:75.06

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 56-40-6: MB7600000

LD50/LC50:

CAS# 56-40-6:

Oral, mouse: LD50 = 4920 mg/kg;

Oral, rat: LD50 = 7930 mg/kg;

Glycine is a non-essential amino acid for human development. It is the only amino acid with no asymmetric carbon.

Carcinogenicity:

CAS# 56-40-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: Major inhibitory neurotransmitter.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-40-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-40-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 22 Do not breathe dust.

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 56-40-6: 0

Canada - DSL/NDSL

CAS# 56-40-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Hematoxylin, certified

ACC# 60290

Section 1 - Chemical Product and Company Identification

MSDS Name: Hematoxylin, certified

Catalog Numbers: BP2424-100, BP2424-25, BP2523-100, BP2523-25, BP2523-5, H345-100, H345-25

Synonyms: Benz (B) Indol (1,2-D) Pyran-3,4,6A,9,10 (6H)-Pentol,7,11B-Dihydro, Cis-(+)-; Hematoxiline; Hydroxybrazilin; Hydroxybrasilin; Natural Black I.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
517-28-2	Hematoxylin	100	208-237-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to yellow crystals.

Caution! May cause eye, skin, and respiratory tract irritation. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hematoxylin	none listed	none listed	none listed

OSHA Vacated PELs: Hematoxylin: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white to yellow

Odor: Not available.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 100 - 120 deg C

Decomposition Temperature: Not available.

Solubility: Soluble in hot water.
Specific Gravity/Density: Not available.
Molecular Formula: C₁₆H₁₄O₆
Molecular Weight: 302.27

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Turns reddish-brown on exposure to light.

Conditions to Avoid: Incompatible materials, light, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, hydrocarbons.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 517-28-2: MH7875000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 517-28-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 517-28-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 517-28-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 517-28-2: 1

Canada - DSL/NDSL

CAS# 517-28-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Hemoglobin

ACC# 10161

Section 1 - Chemical Product and Company Identification

MSDS Name: Hemoglobin

Catalog Numbers: AC411200000, AC411202500

Synonyms: Hb; Hemoglobins.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
9008-02-0	Hemoglobins	100.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown crystalline powder.

Caution! This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.)

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hemoglobins	none listed	none listed	none listed

OSHA Vacated PELs: Hemoglobins: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: brown

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Strong oxidants.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 9008-02-0: MH8802000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 9008-02-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information found.
Physical: No information found.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 9008-02-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 9008-02-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 9008-02-0: No information available.

Canada - DSL/NDSL

CAS# 9008-02-0 is listed on Canada's NDSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Hengar Granules, plain, not selenized

ACC# 89435

Section 1 - Chemical Product and Company Identification

MSDS Name: Hengar Granules, plain, not selenized

Catalog Numbers: S145-500

Synonyms: Aluminum oxide; morin dyed; alumina.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1344-28-1	Aluminum oxide	100.0	215-691-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause respiratory and digestive tract irritation. May cause mechanical eye and skin irritation. May cause lung damage.

Target Organs: None known.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. May cause lung damage.

Chronic: Chronic inhalation of fine dusts may cause lung damage.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum oxide	10 mg/m ³ TWA (particulate matter containing no asbestos and <1% crystalline sili ca)	none listed	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Aluminum oxide: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Odorless.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 2980 deg C

Freezing/Melting Point: 2000 deg C

Decomposition Temperature: Not available.

Solubility: Negligible in water.

Specific Gravity/Density: 4.0 (water=1)

Molecular Formula: Al₂O₃

Molecular Weight: 101.9612

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Reacts with chlorine trifluoride or ethylene oxide. Exothermic reaction above 200 C with halocarbon vapors produces toxic hydrogen chloride and phosgene.

Hazardous Decomposition Products: Hydrogen chloride, phosgene.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1344-28-1: BD1200000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1344-28-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: ~ ~Methanol has been shown to produce fetotoxicity in the embryo or fetus in laboratory animals. Specific developmental abnormalities include: musculoskeletal, urogenital and cardiovascular systems,

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1344-28-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Aluminum oxide (CAS# 1344-28-1, 100.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1344-28-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 1344-28-1: 0

Canada - DSL/NDSL

CAS# 1344-28-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1344-28-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Hydroquinone

ACC# 11230

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydroquinone

Catalog Numbers: AC120910000, AC120910020, AC120910050, AC120915000, AC219930000, AC219930050, AC219930500, S75134, S80041, H329-500

Synonyms: 1,4-Benzenediol; p-Dihydroxybenzene; Hydroquinol; Quinol; 1,4-Dihydroxybenzene; p-Hydroxyphenol; HQ.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
123-31-9	Hydroquinone	99	204-617-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white solid.

Warning! Eye contact may result in permanent eye damage. Possible risks of irreversible effects. Harmful if swallowed. May cause allergic skin reaction. Causes eye and skin irritation. May cause respiratory tract irritation. May cause methemoglobinemia. Light sensitive. Air sensitive. May cause dermatitis. May cause reproductive and fetal effects.

Target Organs: Central nervous system, eyes, skin.

Potential Health Effects

Eye: May result in corneal injury. May cause conjunctivitis and keratitis. Causes eye irritation and possible burns. May cause redness, pain, blurred vision and possible eye

damage.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause dermatitis. Causes redness and pain. May be harmful if absorbed through the skin. Repeated exposure may cause hyperpigmentation of fair skin and depigmentation of dark skin. Causes skin irritation and possible burns. Substance is readily absorbed through the skin.

Ingestion: Harmful if swallowed. May cause severe irritation of the digestive tract. May cause dizziness, nausea, sense of suffocation, increased respiratory rate, vomiting, pallor, muscle twitching, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), delirium, collapse. May cause green or brownish green urine which continues to darken upon standing. May cause liver damage leading to jaundice. May cause harmful nervous system effects, including tremors and convulsions.

Inhalation: Causes cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). May cause respiratory tract irritation. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Central nervous system effects may include confusion, ataxia (failure of muscular coordination), vertigo, tinnitus, weakness, disorientation, lethargy, drowsiness, and finally coma. May be harmful if inhaled. May cause burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Pure hydroquinone does not readily form a vapor at room temperature. The dust may cause irritation of the nose, throat and upper respiratory tract. In the presence of air and moisture, hydroquinone dust may react to form irritating quinone which forms a vapor at room temperature. The rate of this reaction depends on the pH of the medium, with alkaline solutions reacting more readily. Therefore, exposures to hydroquinone dust may involve exposure to quinone vapor which is a respiratory irritant. The degree of irritation depends on how much quinone is formed.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. May cause reproductive and fetal effects. Possible risk of irreversible effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use foam, dry chemical, or carbon dioxide.

Flash Point: 165 deg C (329.00 deg F)

Autoignition Temperature: 550 deg C (1,022.00 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Do not store in direct sunlight.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hydroquinone	2 mg/m ³ TWA	50 mg/m ³ IDLH	2 mg/m ³ TWA

OSHA Vacated PELs: Hydroquinone: 2 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to off-white

Odor: odorless

pH: 3.75 (70g/l aq. soln)

Vapor Pressure: 0.00067 mm Hg @ 25 deg C

Vapor Density: 3.8 (air=1)

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 285 - 287 deg C @ 760 mmHg

Freezing/Melting Point: 170 - 174 deg C

Decomposition Temperature: Not available.

Solubility: 70 g/l @ 20°C

Specific Gravity/Density: 1.320 g/cm³

Molecular Formula: C₆H₆O₂

Molecular Weight: 110.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Substance undergoes color change upon exposure to light and air.

Conditions to Avoid: Light, dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), alkalies.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, phenol.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 123-31-9: MX3500000

LD50/LC50:

CAS# 123-31-9:

Oral, mouse: LD50 = 245 mg/kg;

Oral, mouse: LD50 = 350 mg/kg;

Oral, rabbit: LD50 = 200 mg/kg;

Oral, rat: LD50 = 302 mg/kg;

Oral, rat: LD50 = 320 mg/kg;

Carcinogenicity:

CAS# 123-31-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: Substance may be involved in cancer-forming processes.

Teratogenicity: No information available.

Reproductive Effects: Fertility: Male index, subcutaneous(sct)-rat TDLo=5100 mg/kg; Post-implantation mortality, oral-rat TDLo=2500 mg/kg. Maternal Effects: Menstrual cycle abnormalities, sct-rat TDLo=550mg/kg; Ovaries/fallopian tubes, sct-rat TDLo=5mg/kg. Paternal Effects: Prostate/seminal vesicle/Cowpers gland/urethra and Testes/sperm duct/epididymis, sct-rat TDLo=5100mg/kg.

Mutagenicity: DNA Inhibition: human Hela cell 100umol/L mouse lymphocyte 10umol/L Unscheduled DNA Synthesis: rat oral 8g/kg. Sister Chromatid Exchange: human lymphocyte 5umol/L.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.097 mg/L; 96 Hr.; UnspecifiedFish: Fathead Minnow: LC50 = 0.1-0.18 mg/L; 96 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 0.77-3.97 mg/L; 5,15,30 minutes; Microtox test No data available.

Environmental: Substance has a high biological oxygen demand, and a high potential to affect aquatic organisms. Substance readily biodegrades, and is not likely to bioconcentrate.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	HYDROQUINONE	TOXIC SOLIDS, ORGANIC, N.O.S. (HYDROQUINONE)
Hazard Class:	6.1	6.1
UN Number:	UN2662	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 123-31-9 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 123-31-9: Effective 10/4/84, Sunset 10/4/94

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 123-31-9: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 123-31-9: 500 lb lower threshold TPQ; 10000 lb upper threshold TP Q

SARA Codes

CAS # 123-31-9: immediate, delayed.

Section 313

This material contains Hydroquinone (CAS# 123-31-9, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 123-31-9 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the

CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 123-31-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.

R 40 Limited evidence of a carcinogenic effect.

R 41 Risk of serious damage to eyes.

R 43 May cause sensitization by skin contact.

R 50 Very toxic to aquatic organisms.

R 68 Possible risk of irreversible effects.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 123-31-9: 2

Canada - DSL/NDSL

CAS# 123-31-9 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 123-31-9 is listed on the Canadian Ingredient Disclosure List.

SIGMA CHEMICAL COMPANY -- 23856-2 IGEPAL CA-210 -- 6810-00F056024

=====
Product Identification
=====

Product ID:23856-2 IGEPAL CA-210
MSDS Date:04/01/1995
FSC:6810
NIIN:00F056024
MSDS Number: CGWCQ
=== Responsible Party ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178-5000
Country:US
Info Phone Num:314-771-5765/800-325-3010
Emergency Phone Num:314-771-5765/800-325-3010
CAGE:21076

==== Contractor Identification ====

Company Name:ALDRICH CHEMICAL CO INC
Address:1001 WEST ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:60928

Company Name:FLUKA CHEMICAL CORP
Address:1001 WEST ST PAUL
Box:City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:63181

Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
Composition/Information on Ingredients
=====

Ingred Name:POLY(OXY-1,2-ETHANEDIYL),
ALPHA-(4-OCTYLPHENYL)-OMEGA-HYDROXY- *98-1*
CAS:26636-32-8
RTECS #:MD0878000

=====
Hazards Identification
=====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:MAY BE HARMFUL BY INHALATION,
INGESTION/SKIN ABSORPTION. MAY BE IRRITATING TO EYES, MUCOUS
MEMBRANES & UPPER RESPIRATORY TRACT. SKIN: IRRITATION. MAY AFFECT
THE MALE & FEMALE REPRODUCTIVE SYSTEM.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION

=====
===== First Aid Measures =====

First Aid:EYES: IMMEDIATELY FLUSH W/COPIOUS AMOUNTS OF WATER FOR 15
MINS. SKIN: WASH W/SOAP & COPIOUS AMOUNTS OF WATER. INHALATION:
REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NECESSARY. INGESTION: WASH
OUT MOUTH W /WATER IF CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL
CASES.

=====
===== Fire Fighting Measures =====

Flash Point:>230F
Extinguishing Media:WATER SPRAY, CO2, DRY CHEMICAL POWDER/APPROPRIATE
FOAM
Fire Fighting Procedures:WEAR SELF CONTAINED BREATHING APPARATUS &
PROTECTIVE CLOTHING TO PREVENT CONTACT W/SKIN & EYES. . PREVENT
CONTACT W /SKIN/EYES. COOL CONTAINERS W/WATERSPRAY
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR SELF CONTAINED BREATHING APPARATUS,
RUBBER BOOTS & HEAVY RUBBER GLOVES. COVER W/DRY LIME/SODA ASH, PICK
UP, KEEP IN A CLOSED CONTAINER & HOLD FOR WASTE DISPOSAL. VENTILATE
AREA & WASH SITE AFTER MATERIAL PICKUP IS COMPLETE.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY PLACE. KEEP
TIGHTLY CLOSED. WEAR SUITABLE PROTECTIVE CLOTHING.
Other Precautions:AVOID CONTACT & INHALATION. DON'T GET IN EYES, ON
SKIN/ON CLOTHING.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST
Protective Gloves:RUBBER
Eye Protection:CHEMICAL SAFETY GOGGLES
Other Protective Equipment:SAFETY SHOWER, EYE BATH, PROTECTIVE CLOTHING
Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE. WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

Spec Gravity:1.009
Appearance and Odor:VISCIOUS LIGHT YELLOW LIQUID

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
STRONG OXIDIZING AGENTS, STRONG REDUCING AGENTS
Stability Condition to Avoid: FIRE
Hazardous Decomposition Products: CO, CO2

===== Disposal Considerations =====

Waste Disposal Methods: DISSOLVE/MIX THE MATERIAL W/A COMBUSTIBLE
SOLVENT & BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER
& SCRUBBER. DISPOSE OF IAW/LOCAL, STATE & FEDERAL REGULATIONS.

Disclaimer (provided with this information by the compiling agencies):
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expressly or implied, warrants this information to be accurate and
disclaims all liability for its use. Any person utilizing this
document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Indigo Carmine (Cert.)

ACC# 01888

Section 1 - Chemical Product and Company Identification

MSDS Name: Indigo Carmine (Cert.)

Catalog Numbers: AC412300000, AC412300250

Synonyms: Acid Blue 74; C.I. 73015; 5,5'-Indigodisulfonic acid, disodium salt;

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
860-22-0	C.I. Acid Blue 74	ca. 100	212-728-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark blue solid.

Caution! May cause irritation. May be harmful if swallowed. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: This product contains a cationic dye. Similar dyes have caused permanent injury to the cornea and conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. SPEEDY ACTION IS CRITICAL!

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Store protected from light.

Storage: Keep containers tightly closed. Store protected from light. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
C.I. Acid Blue 74	none listed	none listed	none listed

OSHA Vacated PELs: C.I. Acid Blue 74: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark blue

Odor: Not available.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: 1 g/100 mL @ 25°C

Specific Gravity/Density: Not available.

Molecular Formula: C₁₆H₈N₂Na₂O₈S₂

Molecular Weight: 466.35

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light.

Incompatibilities with Other Materials: Oxidizing agents, nitric acid.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 860-22-0: DU3000000

LD50/LC50:

CAS# 860-22-0:

Oral, mouse: LD50 = 2500 mg/kg;

Oral, rat: LD50 = 2 gm/kg;

Carcinogenicity:

CAS# 860-22-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 860-22-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 860-22-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 860-22-0: 1

Canada - DSL/NDSL

CAS# 860-22-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Indium(II) selenide

- Indium monoselenide

Formula	InSe
Structure	$\text{In}^{2+} \text{Se}^{2-}$
Description	Black hexagonal crystals.
Uses	Substance is used in semiconductor research.

Registry Numbers and Inventories.

CAS	1312-42-1
EC Index Number	034-002-00-8
EC Class	T; R23/25, R33, N; R50-53
UN (DOT)	3283
Merck	12,4986
Beilstein/Gmelin	13718 (G)

Properties.

Formula	InSe
Formula mass	193.78
Melting point, °C	660
Density	5.8 g/cm ³ (20 C)

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT GET WATER INSIDE CONTAINERS.
Stability	No data.

Fire.

Fire fighting	Use method most appropriate to fight surrounding fire.
Fire potential	Non-Combustible
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure effects	The toxicological properties of this substance have not been fully investigated.
Inhalation	Highly toxic, may be fatal if inhaled, swallowed or absorbed through skin. Effects of contact or inhalation may be delayed.
Skin	Avoid any skin contact. See Inhalation.

Eyes See Inhalation.

First aid

Ingestion Seek medical assistance.

Inhalation Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.

Skin Remove and isolate contaminated clothing and shoes. Remove material from skin immediately. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.

Eyes Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 3283

Response guide [151](#)

Hazard class 6.1



Packing Group I; II; III

USCG CHRIS Code SEC

Material Safety Data Sheet

Iodic Acid

ACC# 11180

Section 1 - Chemical Product and Company Identification

MSDS Name: Iodic Acid

Catalog Numbers: A158-100, S80044

Synonyms: Hydrogen Iodate

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7782-68-5	Iodic Acid	>99.5	231-962-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to pale yellow solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Corrosive. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye burns. May cause permanent corneal opacification. May cause chemical conjunctivitis and corneal damage.

Skin: Causes skin burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes

gastrointestinal tract burns. May cause perforation of the digestive tract. May cause systemic effects. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: Causes chemical burns to the respiratory tract. May cause systemic effects. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible. Use water with caution and in flooding amounts. Oxidizer. Greatly increases the burning rate of combustible materials.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Contact professional fire-fighters immediately.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Use with adequate ventilation. Discard contaminated shoes.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Iodic Acid	none listed	none listed	none listed

OSHA Vacated PELs: Iodic Acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to pale yellow
Odor: none reported
pH: Acidic in solution.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 110 deg C
Decomposition Temperature: 110 deg C
Solubility: 2.8 kg/L H₂O @ 0°C
Specific Gravity/Density: 4.629 (water=1)
Molecular Formula: HIO₃
Molecular Weight: 175.9097

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, ignition sources, dust generation, combustible materials, reducing agents.
Incompatibilities with Other Materials: Reducing agents.
Hazardous Decomposition Products: Irritating and toxic fumes and gases, iodine.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7782-68-5 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7782-68-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, CORROSIVE, N.O.S.	No information available.
Hazard Class:	5.1	
UN Number:	UN3085	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7782-68-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7782-68-5: immediate, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7782-68-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

O C

Risk Phrases:

R 34 Causes burns.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 7782-68-5: 1

Canada - DSL/NDSL

CAS# 7782-68-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Iron

ACC# 11490

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron

Catalog Numbers: S71953, S71953-1, S71953-2, S93268, I60-3, I60-500, I62-500

Synonyms: Iron Dust; Iron Metal; Iron Powder.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7439-89-6	IRON	>97	231-096-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black to gray solid.

Warning! Flammable solid. May cause mechanical eye and skin irritation. May cause blood abnormalities. May cause lung damage. Inhalation of fumes may cause metal-fume fever. May cause cardiac disturbances. May cause liver damage.

Target Organs: Liver, respiratory system, cardiovascular system, pancreas.

Potential Health Effects

Eye: Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Acute toxicity may include weakness, shock, cyanosis and acidosis. Delayed symptoms may

include liver

Inhalation: Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause lung damage.

Chronic: Chronic exposure may lead to liver and lung damage. Repeated exposure may cause pancreatic damage, diabetes, and cardiac abnormalities.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Deferoxamine as a chelating agent should be determined only by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.

Extinguishing Media: Use only graphite powder, soda ash, powdered sodium chloride, or an appropriate metal-fire-extinguishing dry powder.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
IRON	none listed	none listed	none listed

OSHA Vacated PELs: IRON: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear impervious gloves.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: black to gray

Odor: none reported

pH: Not available.

Vapor Pressure: 1 mm Hg @ 1787 deg C

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 2750 deg C
Freezing/Melting Point:1535 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble in water.
Specific Gravity/Density:7.86 @ 20°C
Molecular Formula:Fe
Molecular Weight:55.847

Section 10 - Stability and Reactivity

Chemical Stability: Decomposes when heated. Oxidizes when exposed to air.
Conditions to Avoid: Incompatible materials, moisture, exposure to air, excess heat.
Incompatibilities with Other Materials: Acetaldehyde, ammonium peroxodisulfate, chloroformamidinium, chloric acid, ammonium nitrate, halogens, dinitrogen tetroxide, nitryl fluoride, polystyrene, sodium acetylide, potassium dichromate, peroxyformic acid, nitryl fluoride, sulfuric acid, sodium carbide.
Hazardous Decomposition Products: Oxides of iron.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7439-89-6: NO4565500; NO8225000
LD50/LC50:
CAS# 7439-89-6:
Oral, rat: LD50 = 30 gm/kg;

Carcinogenicity:
CAS# 7439-89-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	METAL POWDERS, FLAMMABLE, N.O.S.	METAL POWDER FLAMMABLE NOS (IRON)
Hazard Class:	4.1	4.1
UN Number:	UN3089	UN3089
Packing Group:	II	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7439-89-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7439-89-6: immediate, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7439-89-6 can be found on the following state right to know lists: California.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7439-89-6: 0

Canada - DSL/NDSL

CAS# 7439-89-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D2B.

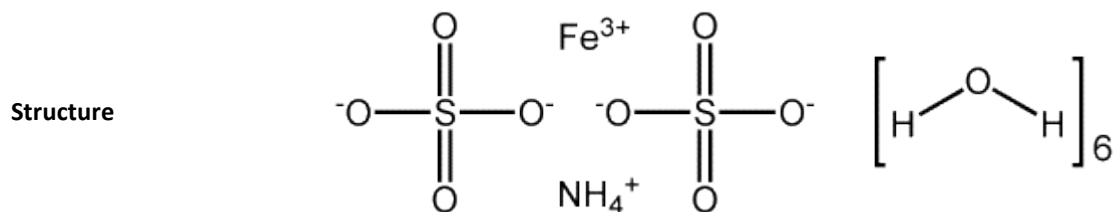
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Ferric ammonium sulfate hexahydrate

- Ammonium ferric sulfate hexahydrate
- Iron(III) ammonium sulfate hexahydrate

Formula $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$



Description Light green powder with a sulforous odor.

Uses Herbicide.

Registry Numbers and Inventories.

CAS 7783-85-9

NIH PubChem CID 197098

EC (EINECS/ELINCS) 616-518-0

RTECS BR6500000

RTECS class Other

UN (DOT) 9119

Beilstein/Gmelin 109801 (G)

EPA OPP 50509

Swiss Giftliste 1 G-4755

Australia AICS Listed

New Zealand Listed

Philippiens PICCS Listed

Properties.

Formula FeH20N2O14S2

Formula mass 392.14

Melting point, °C 100

Density 1.864 g/cm³

Solubility in water Soluble

Hazards and Protection.

Storage Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from light. Store under an inert atmosphere.

Handling Wash hands before eating. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Store protected from light. Handle under an inert atmosphere. Store protected from air. Wash clothing before reuse.

Protection Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Small spills/leaks Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating

dusty conditions. Provide ventilation. Place under an inert atmosphere.

Stability

Stable at room temperature in closed containers under normal storage and handling conditions.

Incompatibilities

Strong oxidizing agents, strong acids, air.

Decomposition

Irritating and toxic fumes and gases, sulfur oxides (SOx), including sulfur oxide and sulfur dioxide, ammonia.

Fire.

Fire fighting

Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing media: Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

Fire potential

May burn but does not ignite readily.

Hazards

Containers may explode when heated.

Combustion products

During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

NFPA

Health 2

Flammability 0

Reactivity 0

Health.

Exposure limit(s)

OEL-UNITED KINGDOM:TWA 1 mg(Fe)/m³;STEL 2 mg(Fe)/m³ JANUARY 1993

Poison_Class

3

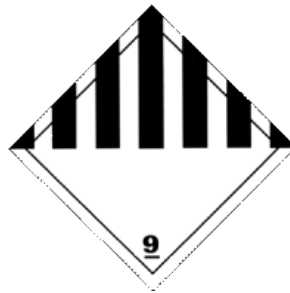
Exposure effects	Effects may be delayed. Chronic exposure may cause liver damage.
Ingestion	May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver damage. May cause cardiac disturbances.
Inhalation	Causes respiratory tract irritation. Can produce delayed pulmonary edema.
Skin	Causes skin irritation.
Eyes	Causes eye irritation. May cause chemical conjunctivitis.

First aid

Ingestion	Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.
Inhalation	Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. DO NOT use mouth-to-mouth respiration.
Skin	Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

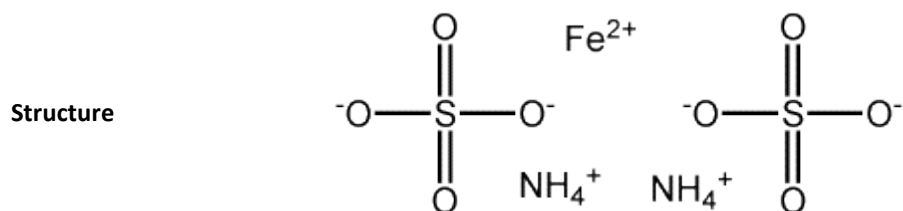
UN number	9119
Response guide	171
Hazard class	9
HS Code	2842 90 90



Ferrous ammonium sulfate

- Ammonium ferrous sulfate
- Diammonium iron bis(sulfate)
- Vitaferro

Formula $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2$



Description A light green crystalline solid.

Uses In photography, as analytical standard, as polymerization catalyst, in dosimeters.

Registry Numbers and Inventories.

CAS	10045-89-3
NIH PubChem CID	24863
EC (EINECS/ELINCS)	233-151-8
RTECS	WS5890000
RTECS class	Other
UN (DOT)	9122
Merck	12,552
Beilstein/Gmelin	34557 (G)
EPA OPP	50506

Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	FeH8N2O8S2
Formula mass	284.05
Melting point, °C	100
Vapor density (air=1)	>1
Density	1.86 g/cm ³ (20 C)
Solubility in water	269 g/L

Hazards and Protection.

Storage	Keep containers tightly closed in a well ventilated area away from food products. Keep away from heat, light, and water. Material will absorb moisture from the atmosphere.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Dust mask; goggles or face shield; protective gloves.

Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Keep material out of water sources and sewers. Build dikes to contain flow as necessary. Land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. Cover solids with a plastic sheet to prevent dissolving in rain or fire fighting water. Water spill: Allow to aerate. Neutralize with agricultural lime (CaO), crushed limestone (CaCO ₃), or sodium bicarbonate (NaHCO ₃). Adjust pH to neutral (pH=7). Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates.
Stability	Slowly oxidizes in air. Ferrous ammonium sulfate hexahydrate.
Incompatibilities	Incompatible with sulfuric acid.

Fire.

Fire fighting	Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.)						
Fire potential	Nonflammable.						
Hazards	Containers may explode when heated.						
Combustion products	Irritating and toxic ammonia and oxides of nitrogen may form in fires.						
NFPA	<table> <tr> <td>Health</td> <td>2</td> </tr> <tr> <td>Flammability</td> <td>0</td> </tr> <tr> <td>Reactivity</td> <td>0</td> </tr> </table>	Health	2	Flammability	0	Reactivity	0
Health	2						
Flammability	0						
Reactivity	0						

Health.

Exposure effects	Blood pressure may be decreased following an iron overdose. Lethargy, restlessness or confusion may be seen early in the poisoning. Convulsions and coma may occur in later phases. Case reports of pregnant women who have received early aggressive treatment (decontamination and/or deferoxamine) have described good fetal outcomes.
Ingestion	Nausea, vomiting, diarrhea and gastrointestinal hemorrhage may develop.
Inhalation	Noncardiogenic pulmonary edema may develop with severe intoxication.
Skin	Severe thermal burn with ferrous sulfate slurry has caused classical symptoms of ingested iron poisoning.
Eyes	Irritants may cause swelling, redness and pain at any site, especially at mucous membranes. The mouth, nose, and eyes are susceptible to these effects.
First aid	

Ingestion	The possible benefit of early removal of some ingested material by cautious gastric lavage must be weighed against potential complications of bleeding or perforation. Activated charcoal binds most toxic agents and can decrease their systemic absorption if administered soon after ingestion. Administer charcoal as a slurry (240 ml water/30 g charcoal). Usual dose: 25 to 100 g in adults/adolescents.
Inhalation	Move victim to fresh air. Apply artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult.
Skin	Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes.
Eyes	Immediately flush with running water for at least 20 minutes.

Transportation.

UN number	9122
Response guide	171
Hazard class	9
USCG CHRIS Code	FAS
Std. Transport #	4962640 4962641



Iron(II) sulfide

- Ferrous sulfide
- Thioxoiron
- Troilite

Formula	FeS
Structure	$\text{Fe}^{2+} \text{S}^{2-}$
Description	Black powder.
Uses	As lab source of hydrogen sulfide, in the ceramic industry, as paintermediateiate pigment, in anodes, in lubricant coatings.

Registry Numbers and Inventories.

CAS	1317-37-9
NIH PubChem CID	14828
EC (EINECS/ELINCS)	215-268-6
Merck	12,4106
Beilstein/Gmelin	13588 (G)
Swiss Giftliste 1	G-8176
Canada DSL/NDSL	DSL
US TSCA	Listed
Austrailia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	FeS
Formula mass	87.92
Melting point, °C	1195
Boiling point, °C	(decomposes)
Vapor pressure, mmHg	1.1144 (1300 C)
Density	4.694 g/cm ³
Solubility in water	Insoluble
Viscosity	3.43 cp (1250 C)

Heat of fusion 11.74 kJ/mol

Hazards and Protection.

Storage	Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Use with adequate ventilation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.
Disposal code	15
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong acids.
Decomposition	Oxides of sulfur, hydrogen sulfide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Extinguishing media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
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Health.

Exposure limit(s)	NIOSH TWA: 1 mg/m ³
Poison_Class	3
Exposure effects	Blood pressure may be decreased following an iron overdose. Lethargy, restlessness or confusion may be seen early in the poisoning. Convulsions and coma may occur in later phases. Case reports of pregnant women who have received early aggressive treatment (decontamination and/or deferoxamine) have described good fetal outcomes.
Ingestion	May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.
Inhalation	May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.
Skin	May cause skin irritation.
Eyes	Dust may cause mechanical irritation.

First aid**Ingestion**

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Skin

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.**HS Code**

2830 90 11

Material Safety Data Sheet

Iron(III)sulfate pentahydrate

ACC# 01891

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron(III)sulfate pentahydrate

Catalog Numbers: AC345230000, AC345230050, AC345235000

Synonyms: None known.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
142906-29-4	Iron(III)sulfate pentahydrate	97%	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to yellow-green crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Iron(III)sulfate pentahydrate	none listed	none listed	none listed
Iron(III) sulfate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Iron(III)sulfate pentahydrate: No OSHA Vacated PELs are listed for this chemical. Iron(III) sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: yellow to yellow-green

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Not available.

Specific Gravity/Density:Not available.

Molecular Formula:Fe₂O₃·5H₂O

Molecular Weight:489.94

Section 10 - Stability and Reactivity

Chemical Stability: Light sensitive. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Incompatible materials, light, dust generation, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Oxides of sulfur.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 142906-29-4 unlisted.

CAS# 10028-22-5: NO8505000

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 142906-29-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 10028-22-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 142906-29-4 is not listed on the TSCA inventory. It is for research and development use only.

CAS# 10028-22-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10028-22-5: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 10028-22-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 142906-29-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 10028-22-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 142906-29-4: No information available.

CAS# 10028-22-5: 1

Canada - DSL/NDSL

CAS# 10028-22-5 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10028-22-5 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Iron(II) sulfate heptahydrate

ACC# 09870

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron(II) sulfate heptahydrate

Catalog Numbers: I146-10, I146-3, I146-3LC, I146-500, I146-500LC, I149-3

Synonyms: Green vitrol; Ferrous sulfate heptahydrate; Iron protosulfate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7782-63-0	Iron(II) sulfate heptahydrate	>99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: blue-green solid.

Warning! Harmful if swallowed. Causes eye and skin irritation. May cause respiratory tract irritation.

Target Organs: Blood, kidneys, central nervous system, liver, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause nausea and vomiting.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause liver and kidney damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects. Exposure to high concentrations may cause central nervous system depression. Animal studies have reported the development of tumors. Oral doses of 960 mg/kg given intermittently over a 9 week period produced jaundice in

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Iron(II) sulfate heptahydrate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed
Ferrous sulfate anhydrous	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Iron(II) sulfate heptahydrate: No OSHA Vacated PELs are listed for this chemical. Ferrous sulfate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: blue-green

Odor: odorless

pH: 3-5 (5% aq. sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: 300 deg C
Freezing/Melting Point:64 deg C
Decomposition Temperature:> 300 deg C
Solubility: 48.6g/100g water at 50C
Specific Gravity/Density:1.898
Molecular Formula:FeSO4.7H2O
Molecular Weight:278.01

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive. Moisture sensitive.
Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.
Hazardous Decomposition Products: Oxides of sulfur, oxides of iron.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7782-63-0: NO8510000

CAS# 7720-78-7: NO8500000

LD50/LC50:

CAS# 7782-63-0:

Oral, mouse: LD50 = 1520 mg/kg;

CAS# 7720-78-7:

Oral, mouse: LD50 = 680 mg/kg;

Oral, rat: LD50 = 319 mg/kg;

Oral, rat: LD50 = 533 mg/kg;

Carcinogenicity:

CAS# 7782-63-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7720-78-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Tumorigenic effects have been reported in experimental animals.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7782-63-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7720-78-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7782-63-0: 1000 lb final RQ (listed under Ferrous sulfate); 454 kg final RQ (listed under F
CAS# 7720-78-7: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7782-63-0: immediate.

CAS # 7720-78-7: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7782-63-0 is listed as a Hazardous Substance under the CWA. CAS# 7720-78-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7782-63-0 can be found on the following state right to know lists: California, (listed as Iron salts (soluble)), Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

CAS# 7720-78-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 46 If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 7782-63-0: No information available.

CAS# 7720-78-7: 1

Canada - DSL/NDSL

CAS# 7720-78-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7782-63-0 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

CAS# 7720-78-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

L-Arginine

ACC# 12379

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Arginine

Catalog Numbers: BP2505-1, BP2505-100, BP2505-500, BP370-100, BP370-100LC, NC9170545, XXBP3725KG

Synonyms: Arginine, L-; Arginine; L-(+)-Arginine; S-(+)-Arginine

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
74-79-3	L-Arginine	>98.5	200-811-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Light sensitive. Moisture sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause erythema (redness) and edema (fluid buildup) with crusting and scaling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The

toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-Arginine	none listed	none listed	none listed

OSHA Vacated PELs: L-Arginine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: none reported

pH: 11.4

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:223 - 224 deg C
Decomposition Temperature:224 deg C
Solubility: Soluble.
Specific Gravity/Density:1.3 (water=1)
Molecular Formula:C₆H₁₄N₄O₂
Molecular Weight:174.1236

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Materials containing similar functional groups can decompose at elevated temperatures.

Conditions to Avoid: High temperatures, incompatible materials, light, dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents, moisture.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 74-79-3: CF1934200

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 74-79-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 74-79-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 74-79-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 74-79-3: 0

Canada - DSL/NDSL

CAS# 74-79-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

L-(+)-glutamine

ACC# 12372

Section 1 - Chemical Product and Company Identification

MSDS Name: L-(+)-glutamine

Catalog Numbers: BP379-100, MT25005CIEM, NC9553689, NC9635202, NC9945819, O2956-100

Synonyms: Glutamine, L-; 2-Aminoglutaramic acid; L-2-Aminoglutaramidic acid; Glutamic acid amide; Glutamic acid 5-amide; gamma-Glutamine * L-Glutamine * Levoglutamid * Levoglutamide

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-85-9	L-glutamine	99-100	200-292-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! Irritant. Causes eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. Expected to be a low ingestion

hazard.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-glutamine	none listed	none listed	none listed

OSHA Vacated PELs: L-glutamine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: practically odorless

pH: 4-6 (2.5% aq. solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:185 deg C
Decomposition Temperature:185-186 deg C
Solubility: Moderately soluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:C5H10N2O3
Molecular Weight:146.0816

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, ammonia.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 56-85-9: MA2275100
LD50/LC50:
CAS# 56-85-9:
Oral, mouse: LD50 = 21700 mg/kg;
Oral, rat: LD50 = 7500 mg/kg;

Carcinogenicity:
CAS# 56-85-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-85-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-85-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 56-85-9: 0

Canada - DSL/NDSL

CAS# 56-85-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

L-Arabinose

ACC# 29177

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Arabinose

Catalog Numbers: AC401430000, AC401430250, AC401431000

Synonyms: None known.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5328-37-0	L-Arabinose	100.0	226-214-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! This is expected to be a low hazard for usual industrial handling.

Target Organs: No data found.

Potential Health Effects

Eye: May cause mild eye irritation.

Skin: Non-irritating to the skin.

Ingestion: Expected to be a low ingestion hazard.

Inhalation: Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Provide ventilation. Minimize dust generation and accumulation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Keep container closed when not in use. No special precautions indicated.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-Arabinose	none listed	none listed	none listed

OSHA Vacated PELs: L-Arabinose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 155 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: >1.0

Molecular Formula: C₅H₁₀O₅

Molecular Weight: 150.13

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon

dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 5328-37-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 5328-37-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5328-37-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5328-37-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 5328-37-0: No information available.

Canada - DSL/NDSL

CAS# 5328-37-0 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

DI-citrulline, 97%

ACC# 00931

Section 1 - Chemical Product and Company Identification

MSDS Name: DI-citrulline, 97%

Catalog Numbers: AC227090000, AC227090050

Synonyms: DL-2-Amino-5-ureidovaleric acid

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
627-77-0	DI-citrulline	97.0	211-012-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: No information regarding eye irritation and other potential effects was found.

Skin: No information regarding skin irritation and other potential effects was found.

Ingestion: The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Inhalation of dust may cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
DI-citrulline	none listed	none listed	none listed

OSHA Vacated PELs: DI-citrulline: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: soluble

Specific Gravity/Density:Not available.

Molecular Formula:C₆H₁₃N₃O₃

Molecular Weight:175.19

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Oxidizing agents

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 627-77-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 627-77-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 627-77-0 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 627-77-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 627-77-0: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

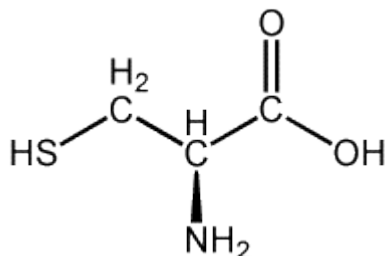
Canadian Ingredient Disclosure List

L-(+)-Cysteine

- (+)-2-Amino-3-mercaptopropionic acid
- (2R)-2-Amino-3-sulfanylpropanoic acid

Formula C₃H₇NO₂S

Structure



Description Crystals.

Uses Biochemical and nutrition research, reducing agent in bread doughs (up to 90 ppm).

Registry Numbers and Inventories.

CAS	52-90-4
NIH PubChem CID	5862
EC (EINECS/ELINCS)	200-158-2
EC Class	Xn, R: 22, S: 22-36/37
RTECS	HA1600000
RTECS class	Drug; Mutagen; Reproductive Effector
Merck	13,2810
Beilstein/Gmelin	1721408
Beilstein Reference	4-04-00-03144
FEMA	3263
Swiss Giftliste 1	G-8327
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	C3H7NO2S
Formula mass	121.16
Melting point, °C	115
Boiling point, °C	254
Vapor density (air=1)	4.2
Critical temperature	479
Critical pressure	59.5
Density	1.523 g/cm ³
Solubility in water	280 g/L
Partition coefficient, pK_{ow}	-0.92

Hazards and Protection.

Storage	Store in a cool, dry place. Do not store in direct sunlight. Keep container closed when not in use. Do not expose to air. Store protected from moisture. Store protected from light. Store under an inert atmosphere.
Handling	Wash hands before eating. Avoid contact with eyes. Avoid ingestion and inhalation. Store protected from light. Handle under an inert atmosphere. Store protected from air. Do not allow contact with water. Keep from contact with moist air and steam.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Protective garments not normally required. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere. Do not get water inside containers.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents.
Decomposition	Nitrogen oxides, carbon monoxide, oxides of nitrogen, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide, nitrogen.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. To extinguish fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire. Do NOT get water inside containers.
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Health.

Poison_Class 4

Exposure effects

Ingestion Ingestion of large amounts may cause gastrointestinal irritation. May be harmful if swallowed.

Inhalation May cause respiratory tract irritation.

Skin May cause skin irritation.

Eyes May cause eye irritation.

First aid

Ingestion Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Skin Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Transportation.

HS Code 2930 90 12

Material Safety Data Sheet

L-Cystine

ACC# 12377

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Cystine

Catalog Numbers: AC111800000, AC111801000, BP377-100, BP377100LC

Synonyms: L(-)-3,3'-Dithiobis(2-aminopropanoic acid)

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-89-3	L-Cystine	99	200-296-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-Cystine	none listed	none listed	none listed

OSHA Vacated PELs: L-Cystine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 260 - 261 deg C (decom)

Decomposition Temperature: 260 - 261 deg C

Solubility: 0.112 g/l @ 25°C

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₂N₂O₄S₂

Molecular Weight: 240.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 56-89-3: HA2690000

LD50/LC50:

CAS# 56-89-3:

Oral, mouse: LD50 = 156 mg/kg;

Carcinogenicity:

CAS# 56-89-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-89-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-89-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 56-89-3: 0

Canada - DSL/NDSL

CAS# 56-89-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

L-(+)-Glutamic Acid

ACC# 10410

Section 1 - Chemical Product and Company Identification

MSDS Name: L-(+)-Glutamic Acid

Catalog Numbers: S80026-1, A125-100, BP378-100, BP378100LC, S800261

Synonyms: Alpha-Aminoglutaric Acid; 2-Aminopentanedioic Acid; Alpha-Glutamic Acid; Levo-Glutamic Acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
56-86-0	Alpha-glutamic acid	ca.100	200-293-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Good laboratory procedures are recommended when handling this compound. This is expected to be a low hazard for usual industrial handling.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.
Chronic: Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. No special precautions indicated.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Alpha-glutamic acid	none listed	none listed	none listed

OSHA Vacated PELs: Alpha-glutamic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Glove protection is not normally required.

Clothing: Protective garments not normally required.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: none reported

pH: 3.3

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 205 deg C
Decomposition Temperature: Not available.
Solubility: Slightly soluble in water.
Specific Gravity/Density: 1.54 (water=1)
Molecular Formula: C₅H₉NO₄
Molecular Weight: 147.0673

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 56-86-0: LZ9700000
LD50/LC50:
CAS# 56-86-0:
Oral, rabbit: LD50 = >2300 mg/kg;
Oral, rat: LD50 = >30 gm/kg;

Carcinogenicity:
CAS# 56-86-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Sister chromatid exchange : Human Lymphocyte: 10 mg/LREFERENCE : MUREAV Mutation Research. (Elsevier Science Pub. B.V., POB 211, 1000 AE Amsterdam, Netherlands) V.1- 1964- Volume(issue)/page/year: 372,75,1996.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-86-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-86-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 56-86-0: 0

Canada - DSL/NDSL

CAS# 56-86-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

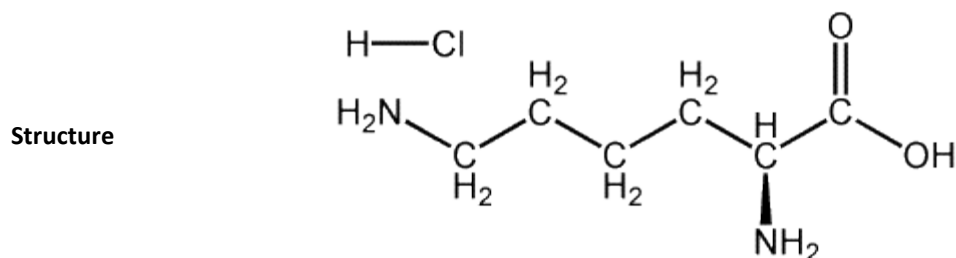
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

L-(+)-Lysine monohydrochloride

- L-(+)-2,6-Diaminocaproic acid hydrochloride
- L-(+)-2,6-Diaminohexanoic acid hydrochloride
- Lyamine
- Darvyl
- (2S)-2,6-Diaminohexanoic acid hydrochloride

Formula $C_6H_{14}N_2O_2 \cdot HCl$



Description White, odorless solid.

Uses Biologically significant amino acid.

Registry Numbers and Inventories.

CAS	657-27-2
NIH PubChem CID	69568
EC (EINECS/ELINCS)	211-519-9
RTECS	OL5650000
RTECS class	Drug
Merck	13,5656
Beilstein/Gmelin	3563889
Beilstein Reference	4-04-00-02717

Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippines PICCS	Listed

Properties.

Formula	C ₆ H ₁₅ CIN ₂ O ₂
Formula mass	182.65
Melting point, °C	263 - 264
Solubility in water	650 g/L

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Small spills/leaks

Clean up spills immediately, using the appropriate protective equipment. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Stability

Stable under normal shipping and handling conditions. However, may decompose if heated.

Incompatibilities

Strong oxidizing agents.

Decomposition

Hydrogen chloride, nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Fire.

Fire fighting

Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

NFPA

Health 1

Flammability 0

Reactivity 0

Health.

Exposure effects

Ingestion

May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation

May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Skin

May cause skin irritation.

Eyes

May cause eye irritation.

First aid

Ingestion

Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

HS Code

2922 41 00

Material Safety Data Sheet

L-Histidine Hydrochloride Monohydrate

ACC# 12392

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Histidine Hydrochloride Monohydrate

Catalog Numbers: BP383-100

Synonyms: Histidine, monohydrochloride, monohydrate, L-; L-Histidine hydrochloride hydrate

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5934-29-2	L-Histidine hydrochloride monohydrate	ca.100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-Histidine hydrochloride monohydrate	none listed	none listed	none listed

OSHA Vacated PELs: L-Histidine hydrochloride monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 251 deg C

Freezing/Melting Point: 80 deg C

Decomposition Temperature: 251 deg C

Solubility: Soluble in water.

Specific Gravity/Density: Not available.
Molecular Formula: C₆H₉N₃O₂.HCl.H₂O
Molecular Weight: 209.63

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 5934-29-2: MS3119000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 5934-29-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5934-29-2 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5934-29-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 5934-29-2: 0

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

I-(+)-Histidine hydrochloride, monohydrate, 98%

ACC# 00824

Section 1 - Chemical Product and Company Identification

MSDS Name: I-(+)-Histidine hydrochloride, monohydrate, 98%

Catalog Numbers: AC120810000, AC120811000

Synonyms:

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5934-29-2	l-histidine hydrochloride monohydrate	>98.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: No information regarding eye irritation and other potential effects was found.

Skin: No information regarding skin irritation and other potential effects was found.

Ingestion: The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: 254 deg C (489.20 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-histidine hydrochloride monohydrate	none listed	none listed	none listed

OSHA Vacated PELs: L-histidine hydrochloride monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 254 deg C

Decomposition Temperature: 254 deg C

Solubility: 169.9 g/l (20 c)

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₉N₃O₂.HCl.H₂O

Molecular Weight: 209.63

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 5934-29-2: MS3119000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 5934-29-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: This substance is a form of the natural amino acid L-Histidine and may be degraded microbiologically.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5934-29-2 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5934-29-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 5934-29-2: 0

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Lactic acid

ACC# 12400

Section 1 - Chemical Product and Company Identification

MSDS Name: Lactic acid

Catalog Numbers: S93271, A159-500, A162-1, A162-500, S80046, S80046-1

Synonyms: 1-Hydroxyethanecarboxylic acid; 2-Hydroxypropanoic acid; 2-Hydroxypropionic acid; Milk acid; DL-Lactic acid; Racemic lactic acid; alpha-Hydroxypropionic acid; 2-Hydroxy-2-methylacetic acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-21-5	Lactic acid	85-90	200-018-0
97-73-4	Lactic anhydride	10-15	202-604-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to slight yellow liquid.

Danger! Causes eye and skin burns. Causes digestive and respiratory tract burns.

Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye burns. Causes redness and pain. May cause chemical conjunctivitis and corneal damage.

Skin: Causes skin burns. Causes redness and pain.

Ingestion: Causes gastrointestinal tract burns.

Inhalation: Causes chemical burns to the respiratory tract. May cause systemic effects.

Chronic: Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Containers may explode when heated.

Extinguishing Media: Cool containers with flooding quantities of water until well after fire is out. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: > 112 deg C (> 233.60 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Discard contaminated shoes.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Lactic acid	none listed	none listed	none listed
Lactic anhydride	none listed	none listed	none listed

OSHA Vacated PELs: Lactic acid: No OSHA Vacated PELs are listed for this chemical. Lactic anhydride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: colorless to slight yellow

Odor: odorless

pH: <1

Vapor Pressure: 0.0813 mm Hg @ 25 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: 122 deg C @ 15 mm Hg
Freezing/Melting Point: 17-33 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: 1.2
Molecular Formula: C₃H₆O₃
Molecular Weight: 90.08

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Metals, strong oxidizing agents, strong reducing agents, strong bases, nitric acid, iodides.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 50-21-5: OD2800000

CAS# 97-73-4 unlisted.

LD50/LC50:

CAS# 50-21-5:

- Draize test, rabbit, eye: 750 ug Severe;
- Draize test, rabbit, skin: 5 mg/24H Severe;
- Draize test, rabbit, skin: 100 mg/24H Moderate;
- Oral, mouse: LD50 = 4875 mg/kg;
- Oral, rat: LD50 = 3543 mg/kg;
- Skin, rabbit: LD50 = >2 gm/kg;

CAS# 97-73-4:

Carcinogenicity:

CAS# 50-21-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 97-73-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in bacteria.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Pseudomonas putida:

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	CORROSIVE LIQUID, ACIDIC, ORGANIC,
Hazard Class:	8	8
UN Number:	UN3265	UN3265
Packing Group:	III	II
Additional Info:		N.O.S.

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 50-21-5 is listed on the TSCA inventory.

CAS# 97-73-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 50-21-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 50-21-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 97-73-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

C

Risk Phrases:

R 34 Causes burns.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 50-21-5: 0

CAS# 97-73-4: No information available.

Canada - DSL/NDSL

CAS# 50-21-5 is listed on Canada's DSL List.

CAS# 97-73-4 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 50-21-5 is listed on the Canadian Ingredient Disclosure List.

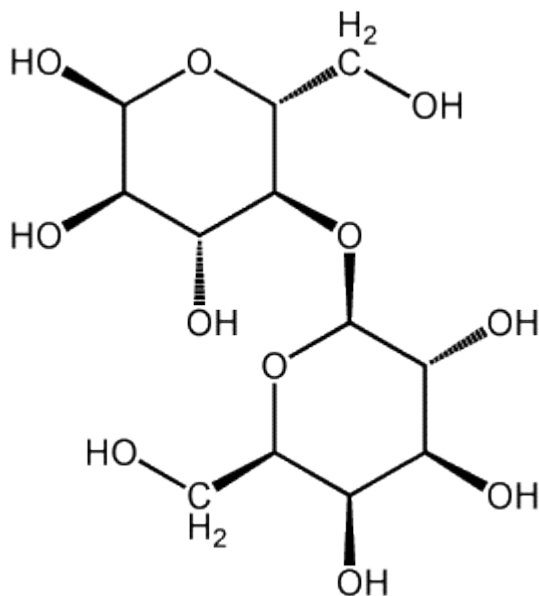
Lactose

- 4-(b-D-Galactosido)-D-glucose
- D-Glucose, 4-O-b-D-galactopyranosyl
- D-Lactose
- Lactin
- Lactobiose
- Milk sugar

Formula

$C_{12}H_{22}O_{11}$

Structure



Description

White hard crystalline powder.

Uses

Both forms of lactose are employed, with the form predominating: as a nutrient in preparing modified milk and food for infants and convalescents (whittier).

Registry Numbers and Inventories.

CAS	63-42-3
NIH PubChem CID	6134
EC (EINECS/ELINCS)	200-559-2
RTECS	OD9625000
RTECS class	Tumorigen; Reproductive Effector; Natural Product
Merck	12,5356
Beilstein/Gmelin	93796
Beilstein Reference	4-17-00-03066
Canada DSL/NDSL	DSL
US TSCA	Listed

Austrailia AICS	Listed
New Zealand	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	C12H22O11
Formula mass	342.3
Melting point, °C	222.8
Boiling point, °C	592
Solubility in water	Very soluble
pKa/pKb	12.39 (pKa)
Partition coefficient, pK_{ow}	-4.12

Hazards and Protection.

Storage	Store in a cool, dry place. Keep container closed when not in use.
Handling	Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up, then place into a suitable container for disposal.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Oxidizers.
Decomposition	Carbon monoxide, carbon dioxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. To extinguish fire use water spray, dry chemical, carbon dioxide, or chemical foam.
----------------------	--

Health.

Exposure effects

Ingestion	May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual industrial handling.
Inhalation	Low hazard for usual industrial handling.
Skin	May cause skin irritation. Low hazard for usual industrial handling.
Eyes	May cause eye irritation.

First aid

Ingestion	Get medical aid if irritation or symptoms occur.
Inhalation	Remove from exposure to fresh air immediately. Get medical aid if cough or other symptoms appear.
Skin	Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

FISHER SCIENTIFIC, CHEMICAL DIV. -- LANTHANUM NITRATE HEXAHYDRATE --
6810-00N047657

=====
===== Product Identification =====

Product ID:LANTHANUM NITRATE HEXAHYDRATE
MSDS Date:06/04/1992
FSC:6810
NIIN:00N047657
MSDS Number: BVHSL
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100 OR 201-796-7523
Emergency Phone Num:201-796-7100/800-424-9300 (CHEMTREC)
CAGE:1B464

==== Contractor Identification ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:NO INGREDIENT FOR THIS FORMULATION_INGREDIENT

=====
===== Fire Fighting Measures =====

Extinguishing Media:WATER ONLY, NO DRY CHEMICAL, CARBON DIOXIDE OR HALON. FOR LARGER FIRES, FLOOD AREA W/WATER FROM A DISTANCE.
Fire Fighting Procedures:USE NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP .
MOVE CNTNR FROM FIRE AREA IF YOU CAN DO IT W/OUT RISK. APPLY COOLING WATER TO SIDES OF CNTNRS EXPOS(SUPDAT)
Unusual Fire/Explosion Hazard:NEGLIG FIRE HAZ WHEN EXPOS TO HEAT/FLAME.
OXIDIZER:OXIDIZERS DECOMPOSE, ESP WHEN HEATED, TO YIELD OXYGEN/OTHER GASES WHICH WILL INCR BURNING RATE OF (ING 2)

=====
===== Exposure Controls/Personal Protection =====

Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:B.P. Text:SUPP DATA
Melt/Freeze Pt:M.P/F.P Text:104F,40C
Spec Gravity:1
Solubility in Water:SOLUBLE
Appearance and Odor:COLORLESS TO WHITE DELIQUESCENT TRICLINIC CRYSTALS;

ODORLESS.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES

COMBUSTIBLE MATLS: OXIDIZING MATERIALS MAY REACT VIOLENTLY. REDUCING AGENTS: MAY REACT.

Stability Condition to Avoid: AVOID CONT W/COMBUST MATLS (WOOD, PAPER, FUEL, OILS, ETC); IGNIT/EXPLO MAY RLST. AVOID CONTAM OF WATER SOURCES.

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Material Safety Data Sheet

Lauric acid

ACC# 01757

Section 1 - Chemical Product and Company Identification

MSDS Name: Lauric acid

Catalog Numbers: AC125110000, AC125110010, AC125110025, AC167280000, AC167280050, AC167281000 AC167281000, AC167285000, AC301500000, AC301500010, AC301500025, AC301501000 AC301501000, AC346580000, AC346580010, AC346585000

Synonyms: Dodecanoic acid.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
143-07-7	Lauric acid	>95	205-582-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Warning! Causes eye and skin irritation.

Target Organs: Eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Use agent most appropriate to extinguish fire.

Flash Point: 156 deg C (312.80 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Lauric acid	none listed	none listed	none listed

OSHA Vacated PELs: Lauric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Flakes

Appearance: white

Odor: Not available.

pH: Not available.

Vapor Pressure: 1 mm Hg @ 121 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 225 deg C @ 100.00m

Freezing/Melting Point: 44 - 46 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: 8830g/cm³

Molecular Formula: C₁₂H₂₄O₂

Molecular Weight: 200.32

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 143-07-7: OE9800000

LD50/LC50:

CAS# 143-07-7:

Draize test, rabbit, eye: 100 mg Mild;

Draize test, rabbit, skin: 500 mg Mild;

Oral, rat: LD50 = 12 gm/kg;

Carcinogenicity:

CAS# 143-07-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 143-07-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 143-07-7: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 143-07-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/39 Wear suitable protective clothing and eye/face protection.

WGK (Water Danger/Protection)

CAS# 143-07-7: 1

Canada - DSL/NDSL

CAS# 143-07-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Lead acetate

ACC# 91795

Section 1 - Chemical Product and Company Identification

MSDS Name: Lead acetate

Catalog Numbers: S75146

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
301-04-2	Lead acetate	100	206-104-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Eye contact may result in permanent eye damage. May cause respiratory and digestive tract irritation. May cause skin irritation. May cause cancer based on animal studies. May cause kidney damage. Affects the blood-forming organs. Air sensitive.

Target Organs: Kidneys, central nervous system, blood forming organs.

Potential Health Effects

Eye: May result in corneal injury. May cause irreversible eye injury. Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause kidney damage.

Inhalation: May cause respiratory tract irritation.

Chronic: Chronic exposure may cause blood effects. May cause kidney damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Calcium disodium EDTA as a chelating agent should be determined by qualified medical personnel. The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel. The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material. Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Handle under an inert atmosphere. Store protected from air. Wash clothing before reuse.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed. Do not expose to air. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Lead acetate	none listed	0.050 mg/m ³ TWA (as Pb) (listed under Lead compounds).	none listed

OSHA Vacated PELs: Lead acetate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: acetic odor - weak odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: Soluble in water and glycerine.
Specific Gravity/Density:Not available.
Molecular Formula:Pb(C₂H₃O₂)₂
Molecular Weight:325.2396

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat.

Incompatibilities with Other Materials: Oxidizing agents, air.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, lead/lead oxides.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 301-04-2: AI5250000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 301-04-2:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 1/1/88
- **NTP:** Suspect carcinogen (listed as Lead compounds).
- **IARC:** Not listed.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 301-04-2: waste number U144.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	LEAD ACETATE	LEAD ACETATE
Hazard Class:	6.1	6.1
UN Number:	UN1616	UN1616
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 301-04-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 301-04-2: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 301-04-2: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

CAS# 301-04-2 (listed as Lead compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 301-04-2 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

CAS# 301-04-2 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 301-04-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65**The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:**

WARNING: This product contains Lead acetate, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 301-04-2: 23 æg/day NSRL (oral)

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T N

Risk Phrases:

R 33 Danger of cumulative effects.

R 48/22 Harmful : danger of serious damage to health by prolonged exposure if swallowed.

R 61 May cause harm to the unborn child.

R 62 Possible risk of impaired fertility.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 301-04-2: 2

Canada - DSL/NDSL

CAS# 301-04-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 301-04-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Lead citrate, trihydrate, 96% (titr.)

ACC# 04573

Section 1 - Chemical Product and Company Identification

MSDS Name: Lead citrate, trihydrate, 96% (titr.)

Catalog Numbers: AC413060000, AC413061000, AC413065000

Synonyms: 1,2,3-Propanetricarboxylic acid, 2-hydroxy-, lead(2+) salt (2:3); 1,2,3-Propanetricarboxylic acid, 2-hydroxy-, lead(2++) salt (2:3); Trilead dicitrate

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
512-26-5	1,2,3-propanetricarboxylic acid, 2-hydroxy-lead(2+)salt(2:3)	96	208-141-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Harmful if swallowed, inhaled, or absorbed through the skin. Potential cancer hazard. May cause cancer based on animal studies. May cause kidney damage. Danger of cumulative effects. This product contains lead, a chemical known to the state of California to cause developmental effects. This product contains lead, a chemical known to the state of California to cause cancer. May cause reproductive and fetal effects.

Target Organs: Blood, kidneys, nerves.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Harmful if absorbed through the skin.

Ingestion: May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. May cause headache. Exposure may cause anemia and other blood abnormalities. May cause degenerative brain changes. Ingestion of lead compounds can

cause toxic effects in the blood-forming organs, kidneys and central nervous system. Acute lead poisoning can cause muscle weakness, "lead line" on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.

Inhalation: Harmful if inhaled. May cause respiratory tract irritation. May cause effects similar to those described for ingestion. May cause irritation of the mucous membranes.

Chronic: May cause paralysis. Repeated exposure may cause nervous system abnormalities with muscle weakness and damage, motor incoordination, and sensation disturbances. Lead salts have been reported to cross the placenta and induce embryo- and fet- mortality.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure. Destroy contaminated shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Wash area with soap and water. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Use with adequate ventilation.

Storage: Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1,2,3-propanetricarboxylic acid, 2-hydroxy-, lead(2+)salt(2:3)	none listed	0.050 mg/m ³ TWA (as Pb) (listed under Lead compounds). 100 mg/m ³ IDLH (as Pb) (listed under Lead compounds).	none listed

OSHA Vacated PELs: 1,2,3-propanetricarboxylic acid, 2-hydroxy-, lead(2+)salt(2:3): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: Not available.
Specific Gravity/Density:Not available.
Molecular Formula:C₁₂H₁₀O₁₄Pb₃.3H₂O
Molecular Weight:1053.85

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, lead/lead oxides.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 512-26-5 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 512-26-5:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 10/1/92 (listed as Lead compounds).
- **NTP:** Suspect carcinogen (listed as Lead compounds).
- **IARC:** Not listed.

Epidemiology: Repeated exposure to lead has caused many toxic effects including: neurological changes, kidney damage, and blood abnormalities. IARC Group 2B: No data available on human carcinogenicity, however sufficient evidence of carcinogenicity in animals.

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in humans.

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No data available.

Physical: No data available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	LEAD COMPOUNDS, SOLUBLE, N.O.S.	No information available.
Hazard Class:	6.1	
UN Number:	UN2291	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 512-26-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 512-26-5: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

CAS# 512-26-5 (listed as Lead compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 512-26-5 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 512-26-5 can be found on the following state right to know lists: California, (listed as Lead compounds), New Jersey, (listed as Lead compounds), Pennsylvania, (listed as Lead compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains 1,2,3-propanetricarboxylic acid, 2-hydroxy-, lead(2+)salt(2:3), listed as 'Lead compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 33 Danger of cumulative effects.

R 61 May cause harm to the unborn child.

R 62 Possible risk of impaired fertility.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 512-26-5: No information available.

Canada - DSL/NDSL

CAS# 512-26-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 512-26-5 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Lead(ii,iv) oxide, red 98%

ACC# 09306

Section 1 - Chemical Product and Company Identification

MSDS Name: Lead(ii,iv) oxide, red 98%

Catalog Numbers: AC221110000, AC221110010, AC221110050, AC221111000, AC221115000

Synonyms: Lead oxide; red lead oxide; Mineral Oxide

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1314-41-6	Lead(II,IV) oxide, red	98.0	215-235-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: bright red solid.

Danger! Oxidizer. Causes eye and skin irritation. Contact with other material may cause fire. Causes digestive and respiratory tract irritation. May cause cancer based on animal studies. May cause kidney damage. May cause central nervous system effects. This substance has caused adverse reproductive and fetal effects in animals.

Target Organs: Kidneys, central nervous system, blood forming organs.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause kidney damage. Many lead compounds can cause toxic effects in the blood-forming organs, kidneys and central nervous

Inhalation: Causes respiratory tract irritation. May cause effects similar to those described for ingestion.

Chronic: Chronic exposure to lead may result in plumbism which is characterized by lead line in gum, headache, muscle weakness, mental changes.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel. The use of Calcium disodium EDTA as a chelating agent should be determined by qualified medical personnel. The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Oxidizer. Greatly increases the burning rate of combustible materials.

Extinguishing Media: Use water only!

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Cover solids with a plastic sheet to prevent dissolving in rain or fire fighting waters.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid ingestion and inhalation. Keep from contact with clothing and other combustible materials. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Lead(II,IV) oxide, red	0.05 mg/m ³ TWA (as Pb) (listed under Lead, inorganic compounds).	0.050 mg/m ³ TWA (as Pb) (listed under Lead compounds).	50 æg/m ³ TWA (as Pb) (listed under Lead, inorganic compounds). 50 æg/m ³ TWA (as Pb); 30 æg/m ³ Action Level (as Pb, Poison - see 29 CFR 1910.102 5) (listed under Lead, inorganic compounds).

OSHA Vacated PELs: Lead(II,IV) oxide, red: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: orange - bright red

Odor: Odorless.

pH: Not available.

Vapor Pressure: 1 mm Hg @ 943 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not applicable.

Boiling Point: 1472.2 deg C

Freezing/Melting Point: 476.7-530 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble in water.

Specific Gravity/Density: 8.32-9.16

Molecular Formula: Pb₃O₄

Molecular Weight: 685.5976

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Explodes on contact with peroxyformic acid.

Conditions to Avoid: Incompatible materials, dust generation, combustible materials, reducing agents, strong oxidants.

Incompatibilities with Other Materials: Strong reducing agents, potassium, hydrogen peroxides, sodium, sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), sulfites, dichloromethylsilane, seleninyl chloride.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, oxygen, lead/lead oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1314-41-6: OG5425000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1314-41-6:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Lead, inorganic compounds').
- **California:** carcinogen, initial date 10/1/92 (listed as Lead compounds).
- **NTP:** Suspect carcinogen (listed as Lead compounds).
- **IARC:** Group 2A carcinogen (listed as Lead, inorganic compounds).

Epidemiology: Repeated exposure to lead has caused many toxic effects including: neurological changes, kidney damage, and blood abnormalities.

Teratogenicity: Specific Developmental Abnormalities: Cardiovascular and Hemeostasis, ivn-hamster TDLo=50 mg/kg; Central Nervous System, oral-rat TDLo=36 mg/kg; Musculoskeletal, ivn-rat TDLo=25 mg/kg. Specific Developmental Abnormalities: Cardiovascular and Homeostasis, ivn-hamster TDLo=50mg/kg; Central Nervous System, oral-rat TDLo=36mg/kg; Musculoskeletal, ivn-rat TDLo=25mg/k

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	LEAD COMPOUNDS, SOLUBLE, N.O.S.	LEAD COMPOUND SOLUBLE NOS (LEAD (II, IV)
Hazard Class:	6.1	6.1
UN Number:	UN2291	UN2291

Packing Group:	III	III
Additional Info:		OXIDE)

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1314-41-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1314-41-6: immediate, delayed, fire.

Section 313

This material contains Lead(II,IV) oxide, red (listed as Lead, inorganic compounds), 98.0%, (CAS# 1314-41-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 1314-41-6 (listed as Lead compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 1314-41-6 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1314-41-6 can be found on the following state right to know lists: California, (listed as Lead compounds), New Jersey, (listed as Lead compounds), New Jersey, (listed as Lead, inorganic compounds), Pennsylvania, (listed as Lead compounds), Minnesota, (listed as Lead, inorganic compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California

Safe Drinking Water Act:

WARNING: This product contains Lead(II,IV) oxide, red, listed as `Lead compounds', a chemical known to the state of California to cause cancer. WARNING: This product contains Lead(II,IV) oxide, red, listed as `Lead, inorganic compounds', a chemical known to the state of California to cause developmental reproductive toxicity.
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T N

Risk Phrases:

- R 20/22 Harmful by inhalation and if swallowed.
- R 33 Danger of cumulative effects.
- R 61 May cause harm to the unborn child.
- R 62 Possible risk of impaired fertility.
- R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S 53 Avoid exposure - obtain special instructions before use.
- S 60 This material and its container must be disposed of as hazardous waste.
- S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 1314-41-6: 2

Canada - DSL/NDSL

CAS# 1314-41-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1314-41-6 (listed as Lead, inorganic compounds) is listed on the Canadian Ingredient Disclosure List.

BARIUM CHEMICALS INC -- LEAD PEROXIDE -- 6810-00D000776

=====
===== Product Identification =====

Product ID:LEAD PEROXIDE
MSDS Date:01/01/1987
FSC:6810
NIIN:00D000776
MSDS Number: BBDHR
=== Responsible Party ===
Company Name:BARIUM CHEMICALS INC
Address:COUNTY RD 44
Box:218
City:STEUBENVILLE
State:OH
ZIP:43952
Country:US
CAGE:EO037

==== Contractor Identification ===
Company Name:BARIUM AND CHEMICALS INC
Address:COUNTY RD 44
Box:218
City:STEUBENVILLE
State:OH
ZIP:43952
Country:US
Phone:740-282-9776
CAGE:20865
Company Name:BARIUM CHEMICALS INC
Address:COUNTY RD 44
Box:218
City:STEUBENVILLE
State:OH
ZIP:43952
Country:US
CAGE:EO037

=====
===== Composition/Information on Ingredients =====

Ingred Name:LEAD PEROXIDE (LEAD DIOXIDE), (OSHA PEL FROM 29CFR
1910.1025)
CAS:1309-60-0
RTECS #:OG0700000
Fraction by Wt: 100%.
OSHA PEL:0.05 MG/M3 (PB)
ACGIH TLV:0.15 MG/M3 (PB); 8990

=====
===== Hazards Identification =====

Effects of
Overexposure:EYE:IRRT.SKN:IRRT.INHL, INGEST:LASS, INSOM, PALLOR, ANOREX
;CONSTIP, ABDOM PAIN, COLIC, ANEMIA, GING LEADLINE

=====
===== First Aid Measures =====

First Aid:INHAL:RMV TO FRESH AIR. IF NOT BRTHNG GIVE CPR; IF BRTHNG
DIFF GIVE OXYGEN. EYE:IMMED FLUSH W/PLENTY OF WATER. SKIN:WASH

W/SOAP&WATER. RMV CONTAM CLTHG&SHOES. INGEST:INDUCE VOMIT. RPT
UNTIL VOMIT IS CLEAR. NOTHING BY MOUTH IF UNCONSC. GET MEDICAL ATTN.

=====
Fire Fighting Measures
=====

Flash Point:NONE
Extinguishing Media:WATER
Fire Fighting Procedures:NONE
Unusual Fire/Explosion Hazard:NONE

=====
Accidental Release Measures
=====

Spill Release Procedures:AVOID DRY SWEEPING & CREATION OF DUST. COLLECT
SPILLAGE W/VACUUM OR WET-SWEEP, PLACE IN CLOSABLE CONTAINER.

=====
Handling and Storage
=====

Handling and Storage Precautions:AVOID EYE,SKN CONTACT. DO NOT INHALE
OR INGEST. LAUNDRY CONTAM CLOTHING BEFORE REUSE AS PER OSHA RULES.
MATERIAL IS OXIDIZER AND POISON.

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:USE HIE RESPIRATOR OR SCBA PP MODE AS REQD.
Ventilation:LOCAL
Protective Gloves:IMPROVISED
Eye Protection:FACE SHIELD LOCAL
Other Protective Equipment:FULL BODY PROTECTION, BOOTS.
Supplemental Safety and Health
MSDS UNDATED & NON-STD RECD 5FEB85.

=====
Physical/Chemical Properties
=====

HCC:D1
Spec Gravity:9.1
Appearance and Odor:BROWN-BLACK POWDER, NO ODOR

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid:YES
NONE
Stability Condition to Avoid:TEMP EXCEEDING 482F/250C.
Hazardous Decomposition Products:NONE

=====
Disposal Considerations
=====

Waste Disposal Methods:RECLAIM OR LANDFILL (AFTER TREATMENT) IAW ALL
LAWS & REGS

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Lead Sulfide

ACC# 12750

Section 1 - Chemical Product and Company Identification

MSDS Name: Lead Sulfide

Catalog Numbers: S80052

Synonyms: Natural lead sulfide; plumbous sulfide

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1314-87-0	Lead sulfide	100.0	215-246-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver solid.

Warning! May cause harm to the unborn child. Causes eye irritation. May cause skin and respiratory tract irritation. Possible risk of impaired fertility. Potential cancer hazard. May cause cancer based on animal studies. May cause central nervous system effects. May cause kidney damage. Affects the blood-forming organs. Danger of cumulative effects.

Target Organs: Kidneys, central nervous system, blood forming organs.

Potential Health Effects

Eye: Causes eye irritation. May cause visual disturbances.

Skin: May cause skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Many lead compounds can cause toxic effects in the blood-forming organs, kidneys, and central

nervous

Inhalation: May cause respiratory tract irritation. May cause effects similar to those described for ingestion.

Chronic: Chronic exposure to lead may result in plumbism which is characterized by lead line in gum, headache, muscle weakness, mental changes.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel. The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel. The use of Calcium disodium EDTA as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Lead sulfide	0.05 mg/m ³ TWA (as Pb) (listed under Lead, inorganic compounds).	0.050 mg/m ³ TWA (as Pb) (listed under Lead compounds).	50 æg/m ³ TWA (as Pb) (listed under Lead, inorganic compounds). 50 æg/m ³ TWA (as Pb); 30 æg/m ³ Action Level (as Pb, Poison - see 29 CFR 1910.102 5) (listed under Lead, inorganic compounds).

OSHA Vacated PELs: Lead sulfide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: silver

Odor: none reported
pH: Not available.
Vapor Pressure: 1 mm Hg @ 852 deg C
Vapor Density: Not available.
Evaporation Rate:Not applicable.
Viscosity: Not applicable.
Boiling Point: 1281.1 deg C
Freezing/Melting Point:1113.9 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble in water.
Specific Gravity/Density:7.5
Molecular Formula:PbS
Molecular Weight:239.26

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents, active metals, sodium.
Hazardous Decomposition Products: Oxides of sulfur, lead/lead oxides.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 1314-87-0: OG4550000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 1314-87-0:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Lead, inorganic compounds').
- **California:** carcinogen, initial date 10/1/92 (listed as Lead compounds).
- **NTP:** Suspect carcinogen (listed as Lead compounds).
- **IARC:** Group 2A carcinogen (listed as Lead, inorganic compounds).

Epidemiology: There are several reports that certain lead compounds administered to animals in high doses are carcinogenic, primarily producing renal tumors. Salts demonstrating carcinogenicity in animals are usually soluble salts. Epidemiological studies have not shown a relationship between lead exposure and the incidence of cancer in lead workers. However, one study of lead-exposed workers demonstrated a statistically

significant elevation in the standardized mortality ratio for gastric and lung cancer in battery plant workers only.

Teratogenicity: Lead penetrates the placental barrier and has caused fetal abnormalities in animals. Excessive exposure to lead during pregnancy has caused neurological disorders in infants.

Reproductive Effects: Reproductive effects from lead have been documented in animals and human beings of both sexes. In battery workmen with a mean exposure of 8.5 years to lead, there was an increased frequency of sperm abnormalities as compared with a control group.

Mutagenicity: No data available.

Neurotoxicity: Subtle neurologic effects have been demonstrated with relatively low blood levels of lead. The performance of lead workers on various neurophysiological tests was mildly reduced when compared with a control group. Anxiety, depression, poor concentration, forgetfulness, mild reductions in motor and sensory nerve conduction velocities have been documented in lead-exposed workers.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: May be toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1314-87-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 1314-87-0: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Lead sulfide (listed as Lead, inorganic compounds), 100.0%, (CAS# 1314-87-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 1314-87-0 (listed as Lead compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 1314-87-0 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

CAS# 1314-87-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1314-87-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Lead, inorganic compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Lead sulfide, listed as 'Lead compounds', a chemical known to the state of California to cause cancer. WARNING: This product contains Lead sulfide, listed as 'Lead, inorganic compounds', a chemical known to the state of California to cause developmental reproductive toxicity.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 33 Danger of cumulative effects.

R 61 May cause harm to the unborn child.

R 62 Possible risk of impaired fertility.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 1314-87-0: No information available.

Canada - DSL/NDSL

CAS# 1314-87-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1314-87-0 (listed as Lead, inorganic compounds) is listed on the Canadian Ingredient Disclosure List.

E M SCIENCE, A DIVISION OF EM INDUSTRIES -- LEAD TETRAOXIDE -- 6810-00-241-1120

=====
===== Product Identification =====

Product ID:LEAD TETRAOXIDE
MSDS Date:07/23/1993
FSC:6810
NIIN:00-241-1120
MSDS Number: BWMP5
=== Responsible Party ===
Company Name:E M SCIENCE, A DIVISION OF EM INDUSTRIES
Address:480 DEMOCRAT RD
Box:70
City:GIBBSTOWN
State:NJ
ZIP:08027
Country:US
Info Phone Num:609-354-9200
Emergency Phone Num:609-354-9200/800-424-9300 (CHEMTREC)
CAGE:EO379

==== Contractor Identification ====

Company Name:CHEMICAL COMMODITIES AGENCY, INC.
Address:27447 PACIFIC STREET
Box:City:HIGHLAND
State:CA
ZIP:92346-2640
Country:US
Phone:909-864-2310
CAGE:60777
Company Name:E M SCIENCE
Address:480 DEMOCRATE RD
Box:70
City:GIBBSTOWN
State:NJ
ZIP:08027
Country:US
Phone:609-354-9200/800-424-9300 (CHEMTREC)
CAGE:0SK29
Company Name:E M SCIENCE, A DIV OF E M INDUSTRIES INC.
Address:111 WOODCREST RD
Box:70
City:CHERRY HILL
State:NJ
ZIP:08034-0395
Country:US
Phone:609-354-9200 FAX: 609-423-4389
CAGE:EO379

=====
===== Composition/Information on Ingredients =====

Ingred Name:LEAD OXIDE, (RED LEAD OXIDE)
CAS:1314-41-6
RTECS #:OG5425000
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:SEE 1910.1025

ACGIH TLV:0.15 MG/M3

=====
===== Hazards Identification =====

LD50 LC50 Mixture:LD50 (IPR, RAT) IS 650 MG/KG.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:YES OSHA:NO
Health Hazards Acute and Chronic:TARGET ORGANS:EYES, BLOOD, NERVOUS AND
DIGESTIVE SYSTEMS. ACUTE AND CHRONIC- CUMULATIVE POISON! HARMFUL IF
INHALED OR SWALLOWED. MAY CAUSE DAMAGE TO BLOOD, NERVOUS AND
DIGESTIVE SYSTEMS. OVEREXPOSURE MAY CAUSE ABDOMINAL PAINS, COLIC,
ANEMIA, WEIGHT LOSS, INSOMNIA, EYE PROBLEMS, CONSTIPATION.
Explanation of Carcinogenicity:MAY BE CARCINOGENIC TO HUMAN.
Effects of Overexposure:METALLIC TASTE, ABDOMINAL PAIN, CONSTIPATION,
FATIGUE, SLEEPLESS, COLIC, WEIGHT LOSS

=====
===== First Aid Measures =====

First Aid:GET MEDICAL HELP IN ALL CASES. INHALED:REMOVE TO FRESH AIR.
PROVIDE CPR/OXYGEN IF NEEDED. EYES:FLUSH WITH WATER FOR 15 MINUTES.
HOLD EYELIDS OPEN. SKIN:WASH WITH SOAP AND WATER. ORAL:IF
CONSCIOUS, DRINK WATER AND IMMEDIATELY INDUCE VOMITING AS DIRECTED
BY MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN
UNCONSCIOUS PERSON.

=====
===== Fire Fighting Measures =====

Flash Point:NONE
Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, ALCOHOL FOAM, WATER
Fire Fighting Procedures:WEAR FULL PROTECTIVE CLOTHING AND
NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS.
Unusual Fire/Explosion Hazard:COMBUSTIBLE BY CHEMICAL REACTION WITH
REDUCING AGENTS. EXPLODES ON CONTACT WITH PEROXYFORMIC ACID.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR PROTECTIVE EQUIPMENT. VENTILATE AREA.
REMOVE IGNITION SOURCES. CONTAIN SPILL. WITH CLEAN DRY SHOVEL,
PLACE MATERIAL INTO A CLEAN DRY CONTAINER AND COVER. MOVE
CONTAINERS FROM SPILL AREA. AVOID GENERATING DUST.
Neutralizing Agent:NOT RELEVANT

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY, WELL VENTILATED
AREA AWAY FROM INCOMPATIBLE MATERIALS.
Other Precautions:WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR
SMOKING. DO NOT GENERATE DUST. DO NOT BREATHE DUST. DO NOT GET IN
EYES, ON SKIN, OR ON CLOTHING. KEEP OUT OF REACH OF CHILDREN.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH-APPROVED SELF-CONTAINED BREATHING
APPARATUS OPERATED IN POSITIVE PRESSURE MODE OR SUPPLIED-AIR
RESPIRATOR IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT IS EXCEEDED.
Ventilation:USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV
REQUIREMENTS.

Protective Gloves:NEOPRENE
Eye Protection:DUST-RESISTANT GOGGLES
Other Protective Equipment:EYE WASH STATION, QUICK DRENCH SHOWER AND IMPERVIOUS CLOTHING
Work Hygienic Practices:OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT TAKE INTERNALLY.
Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:N1
NRC/State Lic Num:NOT RELEVANT
Boiling Pt:B.P. Text:2682F,1472C
Melt/Freeze Pt:M.P/F.P Text:1634F,890C
Spec Gravity:9.1
Viscosity:NOT RELEVANT
Evaporation Rate & Reference:NOT RELEVANT
Solubility in Water:INSOLUBLE
Appearance and Odor:RED, HEAVY POWDER

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
HEAT IN THE PRESENCE OF ALUMINUM, SODIUM, TITANIUM, ZINC; REDUCING AGENTS, HYDROGEN PEROXIDE
Stability Condition to Avoid:TEMPERATURES ABOVE 930F.
Hazardous Decomposition Products:LEAD

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. EPA WASTE NUMBERS: D001, D008. CONTACT YOUR LOCAL PERMITTED WASTE DISPOSAL SITE (TSD) FOR PERMISSIBLE TREATMENT SITES.

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Material Safety Data Sheet

Linoleic acid

ACC# 97109

Section 1 - Chemical Product and Company Identification

MSDS Name: Linoleic acid

Catalog Numbers: AC215040000, AC215040050, AC215040250

Synonyms: Linolic acid; (Z,Z)-9,12-Octadecadienoic acid.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-33-3	Linoleic acid	60+	200-470-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear colorless to light yellow liquid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: > 112 deg C (> 233.60 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a dry area. Keep under a nitrogen blanket. Keep refrigerated. (Store below 4°C/39°F.)

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Linoleic acid	none listed	none listed	none listed

OSHA Vacated PELs: Linoleic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear colorless to light yellow

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 229 - 230 deg C @ 16 mmHg

Freezing/Melting Point: -5 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: 0.900 g/cm³

Molecular Formula: C₁₈H₃₂O₂

Molecular Weight: 280.45

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive. Light sensitive.

Conditions to Avoid: Incompatible materials, light, exposure to air, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, reducing agents, bases.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 60-33-3: RF9990000

LD50/LC50:

CAS# 60-33-3:

Oral, mouse: LD50 = >50 gm/kg;

Carcinogenicity:

CAS# 60-33-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: Teratogenic effects have been observed in experimental animals.

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Invertebrate toxicity: EC50 (duration unspecified) purple sea urchin 0.28-1.07 mg/kg inhibited fertilisation (Cherr,G.N. et al Environ.Toxicol.Chem. 1987, 6(7), 561-569).

Environmental: Anaerobic effects: Readily biodegradable in batch bioassay inoculated with anaerobic granular sludge at 30°C and 35-200 mg/l linoleic acid (Sierra-Alvarez,R. et al Environ.Technol.1990, 11(10), 891-898). Degradation studies: The correlation between BOD and COD for fatty acids was studied. COD values were 1.2-29.6% ThOD averaging 8.38%. BOD values were 12.7-98.8% ThOD averaging 71% BOD/COD ratio 2.76-52.9% (Matsuoka,C. et al Kenkyu =kiyo-Tokushima Bunri Daigaku 1987, 34, 193-199 (Japan.)).

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste

regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		(6.1)
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-33-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 60-33-3: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-33-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 60-33-3: 1

Canada - DSL/NDSL

CAS# 60-33-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 60-33-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Linseed Oil Boiled

ACC# 71365

Section 1 - Chemical Product and Company Identification

MSDS Name: Linseed Oil Boiled

Catalog Numbers: S80055

Synonyms: Flaxseed Oil

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
8001-26-1	Linseed Oil	100.0	232-278-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown liquid.

Caution! May cause allergic skin reaction. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Contact may cause transient eye irritation.

Skin: Prolonged and/or repeated contact may cause irritation and/or dermatitis. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: Aspiration hazard. Ingestion of large amounts may cause gastrointestinal

irritation. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation: Causes respiratory tract irritation.

Chronic: May cause allergic skin reaction in some individuals.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use dry chemical to fight fire. Use carbon dioxide.

Flash Point: 206.1 deg C (402.98 deg F)

Autoignition Temperature: 343.3 deg C (649.94 deg F)

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with skin and eyes. Keep away from heat, sparks and flame. Do not ingest or inhale. Wash clothing before reuse.

Storage: Keep away from heat, sparks, and flame. Store in a cool, dry place. Store in a tightly closed container. Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Linseed Oil	none listed	none listed	none listed

OSHA Vacated PELs: Linseed Oil: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective gloves to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: yellow to brown

Odor: peculiar odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: >1.0

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: > 315.6 deg C
Freezing/Melting Point:-23.9 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble in water
Specific Gravity/Density:0.925 - 0.935
Molecular Formula:Not applicable.
Molecular Weight:Not available

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, excess heat.
Incompatibilities with Other Materials: Nitric acid, chlorine, strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 8001-26-1: 019690000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 8001-26-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 8001-26-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 8001-26-1 can be found on the following state right to know lists: Pennsylvania.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 8001-26-1: 1

Canada - DSL/NDSL

CAS# 8001-26-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 8001-26-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Lithium Carbonate

ACC# 12880

Section 1 - Chemical Product and Company Identification

MSDS Name: Lithium Carbonate

Catalog Numbers: L119-500

Synonyms: Carbonic Acid Dilithium Salt; Carbonic Acid Lithium Salt

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
554-13-2	Lithium carbonate	98.0	209-062-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! May be harmful if swallowed. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause kidney damage. May cause central nervous system effects. May cause reproductive and fetal effects.

Target Organs: Kidneys, central nervous system.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation.

Chronic: Chronic exposure to lithium salts may cause drowsiness, visual abnormalities, weakness, ringing in the ears, and muscle tremors.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Lithium carbonate	none listed	none listed	none listed

OSHA Vacated PELs: Lithium carbonate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 1310 deg C

Freezing/Melting Point: 618 deg C

Decomposition Temperature: 1310 deg C

Solubility: 1.5% in water.

Specific Gravity/Density:2.1 (water=1)

Molecular Formula:Li₂CO₃

Molecular Weight:73.8802

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, fluorine.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, oxides of lithium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 554-13-2: OJ5800000

LD50/LC50:

CAS# 554-13-2:

Oral, mouse: LD50 = 531 mg/kg;

Oral, mouse: LD50 = 531 mg/kg;

Oral, rabbit: LD50 = 404 mg/kg;

Oral, rat: LD50 = 525 mg/kg;

Oral, rat: LD50 = 553 mg/kg;

Carcinogenicity:

CAS# 554-13-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 554-13-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 554-13-2: delayed.

Section 313

This material contains Lithium carbonate (CAS# 554-13-2, 98.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 554-13-2 can be found on the following state right to know lists: New Jersey, Massachusetts.

California Prop 65

WARNING: This product contains Lithium carbonate, a chemical known to the state of California to cause developmental reproductive toxicity.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36 Irritating to eyes.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 554-13-2: 1

Canada - DSL/NDSL

CAS# 554-13-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

L-Phenylalanine

ACC# 12374

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Phenylalanine

Catalog Numbers: BP391-100

Synonyms: (S)-Alpha-Amino-Benzenepropanoic Acid; Beta-Phenyl-Alpha-Alanine; 3-Phenylalanine.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
63-91-2	L-Phenylalanine	ca.100	200-568-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This substance has caused adverse reproductive and fetal effects in animals. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Prolonged or repeated exposure may cause adverse reproductive effects. May cause fetal effects. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. May form flammable dust-air mixtures. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-Phenylalanine	none listed	none listed	none listed

OSHA Vacated PELs: L-Phenylalanine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: slight odor

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:270 - 275 deg C
Decomposition Temperature:275 deg C
Solubility: Soluble.
Specific Gravity/Density:0.754 (water=1)
Molecular Formula:C9H11NO2
Molecular Weight:165.0825

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 63-91-2: AY7535000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 63-91-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 63-91-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 63-91-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 63-91-2: 0

Canada - DSL/NDSL

CAS# 63-91-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Magnesium acetate tetrahydrate

ACC# 13301

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium acetate tetrahydrate

Catalog Numbers: BP215-500, BP215500LC, M13-500, NC9001327, XXM13150LB

Synonyms: Acetic acid, magnesium salt, tetrahydrate; Magnesium diacetate tetrahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
16674-78-5	Magnesium acetate tetrahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this

substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of calcium gluconate to precipitate the oxalate should be determined by only qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium acetate tetrahydrate	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium acetate tetrahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: acetic odor - weak odor

pH: 7-9 (5% soln.)

Vapor Pressure: Negligible.

Vapor Density: 7.4
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 80 deg C
Decomposition Temperature: Not available.
Solubility: 120% in water.
Specific Gravity/Density: 1.454 (water=1)
Molecular Formula: C₄H₆O₄Mg.4H₂O
Molecular Weight: 214.3982

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Moisture, strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 16674-78-5 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 16674-78-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 16674-78-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 16674-78-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 16674-78-5: 0

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Magnesium Hydroxide

ACC# 13405

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium Hydroxide

Catalog Numbers: S80064, S93293, M342-500

Synonyms: Magnesia magma; Magnesium Hydrate, Milk of Magnesia.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1309-42-8	MAGNESIUM HYDROXIDE	95-100	215-170-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. Excessive amounts of magnesium may cause central nervous system depression, respiratory paralysis, and cardiac

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: Repeated exposure may cause kidney damage and digestive tract abnormalities.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Antidote: Intravenous calcium chloride (10 to 20 cc of 5% solution, diluted if desirable with isotonic saline) counteracts the toxic actions of magnesium. Also, physostigmine 0.5 to 1.0 mg subcutaneously.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Local exhaust may be necessary to control concentrations to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
MAGNESIUM HYDROXIDE	none listed	none listed	none listed

OSHA Vacated PELs: MAGNESIUM HYDROXIDE: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 9.5-10.5 (slurry)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 350 deg C

Decomposition Temperature: 350 deg C

Solubility: Insoluble in water.
Specific Gravity/Density: 2.36 (water=1)
Molecular Formula: Mg(OH)₂
Molecular Weight: 58.3178

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Phosphorus (spontaneous ignition).

Hazardous Decomposition Products: Oxides of magnesium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1309-42-8: OM3570000

LD50/LC50:

CAS# 1309-42-8:

Oral, mouse: LD50 = 8500 mg/kg;

Oral, rat: LD50 = 8500 mg/kg;

Carcinogenicity:

CAS# 1309-42-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1309-42-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1309-42-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 1309-42-8: 1

Canada - DSL/NDSL

CAS# 1309-42-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Magnesium nitrate hexahydrate

ACC# 13441

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium nitrate hexahydrate

Catalog Numbers: AC217560000, AC217560010, AC217565000, AC423880000, AC423880050, AC423885000, S73058, S73059, S80065, S93294, M46-212, M46-500

Synonyms: Magnesium dinitrate hexahydrate; Nitric acid, magnesium salt hexahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13446-18-9	Magnesium nitrate hexahydrate	>98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless or white solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause eye, skin, and respiratory tract irritation. May cause central nervous system depression. May cause methemoglobinemia. May cause cardiac disturbances. May cause kidney damage.

Target Organs: Blood, kidneys.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. May cause nausea, vomiting,

and diarrhea, possibly with blood. Excessive amounts of magnesium may cause central nervous system depression, respiratory paralysis, and cardiac

Inhalation: May cause respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause effects similar to those described for ingestion.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. Repeated exposure may cause kidney damage and digestive tract abnormalities. Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Calcium disodium EDTA as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water with caution and in flooding amounts. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Use water only! Contact professional fire-fighters immediately. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Remove all sources of ignition. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium nitrate hexahydrate	none listed	none listed	none listed
Magnesium nitrate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium nitrate hexahydrate: No OSHA Vacated PELs are listed for this chemical. Magnesium nitrate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate protective clothing to prevent skin

exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless or white

Odor: none reported

pH: 5.0-8.2; 5% solution

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 89 deg C

Decomposition Temperature: 330 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.46 (water=1)

Molecular Formula: MgN₂O₆·6H₂O

Molecular Weight: 256.41

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Deliquescent (tending to absorb atmospheric water vapor and become liquid).

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Reducing agents, organic materials, combustible materials.

Hazardous Decomposition Products: Nitrogen oxides, oxides of magnesium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 13446-18-9: OM3756000

CAS# 10377-60-3 unlisted.

LD50/LC50:

CAS# 13446-18-9:

Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, rat: LD50 = 5440 mg/kg;

CAS# 10377-60-3:

Carcinogenicity:

CAS# 13446-18-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 10377-60-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	MAGNESIUM NITRATE	MAGNESIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1474	UN1474
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13446-18-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10377-60-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 13446-18-9: immediate, delayed, fire.

Section 313

This material contains Magnesium nitrate hexahydrate (listed as Water Dissociable Nitrate Compounds), >98%, (CAS# 13446-18-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Magnesium nitrate anhydrous (listed as Water Dissociable Nitrate Compounds), -%, (CAS# 10377-60-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 13446-18-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 10377-60-3 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

○

Risk Phrases:

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

WGK (Water Danger/Protection)

CAS# 13446-18-9: 1

CAS# 10377-60-3: 1

Canada - DSL/NDSL

CAS# 10377-60-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 13446-18-9 is not listed on the Canadian Ingredient Disclosure List.

CAS# 10377-60-3 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Magnesium sulfate, anhydrous

ACC# 13510

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium sulfate, anhydrous

Catalog Numbers: AC193440000, AC394510000, AC413480000, AC413480025, AC413480050, AC413480250, AC413485000, S80067, S93295, M65-100LB, M65-3, M65-500, M65-500LC, M65J-500

Synonyms: Sulfuric acid magnesium salt (1:1)

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7487-88-9	Magnesium sulfate, anhydrous	97+	231-298-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to gray white solid.

Caution! May cause eye, skin, and respiratory tract irritation. May be harmful if swallowed, inhaled, or absorbed through the skin. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be

harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium sulfate, anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium sulfate, anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to gray white

Odor: odorless

pH: 7.9 (5% aq.sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 1124 deg C

Decomposition Temperature: > 700 deg C

Solubility: 26 g/100mL (0°C)
Specific Gravity/Density: 2.65
Molecular Formula: MgO4S
Molecular Weight: 120.37

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, explosive when heated with ethoxyethyl alcohols.

Hazardous Decomposition Products: Sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide, oxides of magnesium.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7487-88-9: OM4500000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7487-88-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: Teratogenic effects have occurred in humans.

Reproductive Effects: Adverse reproductive effects have occurred in humans.

Mutagenicity: Mutation in bacteria.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7487-88-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7487-88-9: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7487-88-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7487-88-9: 0

Canada - DSL/NDSL

CAS# 7487-88-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Magnesium, turnings, 99.9+%

ACC# 96218

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium, turnings, 99.9+%

Catalog Numbers: AC191080000, AC191080025, AC191085000

Synonyms: Magnesium metal (ribbons/turnings)

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7439-95-4	Magnesium	99.9	231-104-6

Hazard Symbols: F

Risk Phrases: 11 15

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver solid. **Warning!** May cause mechanical eye and skin irritation.

Inhalation of fumes may cause metal-fume fever. May cause respiratory tract irritation. Air sensitive. Moisture sensitive. Water-reactive.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Particles embedded in the skin may cause "chemical gas gangrene" with symptoms of persistent lesions, inflammation and gas bubbles under the skin.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills,

cough, weakness, chest pain, muscle pain and increased white blood cell count.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water Reactive. Material will react with water and may release a flammable and/or toxic gas. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. Flammable solid. May react with acids or moisture to form explosive hydrogen gas.

Extinguishing Media: Use only graphite powder, soda ash, powdered sodium chloride, or an appropriate metal-fire-extinguishing dry powder. Do NOT use water, carbon dioxide, or foam.

Flash Point: Not applicable.

Autoignition Temperature: 883 deg F (472.78 deg C)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Water free area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: silver

Odor: None reported.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Negligible.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 1107 deg C @ 760.00mm Hg

Freezing/Melting Point:651 deg C
Decomposition Temperature:Not available.
Solubility: reacts with water
Specific Gravity/Density:1.7400g/cm3
Molecular Formula:Mg
Molecular Weight:24.30

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, exposure to air, exposure to moist air or water.
Incompatibilities with Other Materials: Oxygen, moisture, chlorinated solvents, methanol, hydrogen peroxide, oxidizing agents, sulfur compounds, metal oxides, metal cyanides, metal oxide salts, fluorine, carbonates, halogens, phosphates.
Hazardous Decomposition Products: Oxides of magnesium.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7439-95-4: FW6475100
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7439-95-4: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: No information available.
Other Studies: None.

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information reported
Physical: No information available.
Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	MAGNESIUM				No information available.
Hazard Class:	4.1				
UN Number:	UN1869				
Packing Group:	III				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7439-95-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7439-95-4: acute, flammable, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7439-95-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

F

Risk Phrases:

R 11 Highly flammable.

R 15 Contact with water liberates extremely flammable gases.

Safety Phrases:

S 7/8 Keep container tightly closed and dry.

S 43A In case of fire, use dry chemical (never use water).

WGK (Water Danger/Protection)

CAS# 7439-95-4: No information available.

Canada - DSL/NDSL

CAS# 7439-95-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D2B.

Canadian Ingredient Disclosure List**Exposure Limits**

Material Safety Data Sheet

Maleic acid

ACC# 13550

Section 1 - Chemical Product and Company Identification

MSDS Name: Maleic acid

Catalog Numbers: AC125230000, AC125230010, AC125230050, AC125230051, AC125230250, AC125231000, AC125235000, O3417-500

Synonyms: cis-Butenedioic acid; cis-1,2-Ethylenedicarboxylic acid; Maleinic acid; Toxilic acid; (2Z)-2-Butenedioic acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
110-16-7	Maleic acid	>98	203-742-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Warning! Causes eye, skin, and respiratory tract irritation. May be harmful if swallowed or absorbed through the skin.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: May result in corneal injury. Contact with eyes may cause severe irritation, and possible eye burns.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause dermatitis. May be harmful if absorbed through the skin.

Ingestion: May cause kidney damage. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation.

Chronic: Chronic exposure may cause kidney damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Do NOT allow victim to rub eyes or keep eyes closed.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust from this material can form explosive organic dust cloud.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Avoid breathing dust.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Maleic acid	none listed	none listed	none listed

OSHA Vacated PELs: Maleic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: faint, acidulous odor

pH: 1.3 (10% aq soln)

Vapor Pressure: 0.00004 mm Hg @ 25 deg C

Vapor Density: Not applicable.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 134-138 deg C

Decomposition Temperature: > 135 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.59
Molecular Formula: C₄H₄O₄
Molecular Weight: 116.07

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, strong bases.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 110-16-7: OM9625000

LD50/LC50:

CAS# 110-16-7:

Draize test, rabbit, eye: 100 mg Severe;

Draize test, rabbit, eye: 1%/2M Severe;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = >720 mg/m³/1H;

Oral, mouse: LD50 = 2400 mg/kg;

Oral, rat: LD50 = 708 mg/kg;

Skin, rabbit: LD50 = 1560 mg/kg;

Carcinogenicity:

CAS# 110-16-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 5 mg/L; 96 Hr.; Unspecified

Fish: Mosquito Fish: LC50 = 240 mg/L; 24-48 Hr.; Unspecified
Daphnia: Daphnia: 316.2 mg/l; 48h; EC50

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (MALEIC ACID)	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (MALEIC ACID)
Hazard Class:	8	8
UN Number:	UN3261	UN3261
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 110-16-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 110-16-7: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 110-16-7: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 110-16-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 110-16-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37 Wear suitable gloves.

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 110-16-7: 1

Canada - DSL/NDSL

CAS# 110-16-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 110-16-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Manganese (II) nitrate 50% solution, 5% nitric acid, 45% water
ACC# 13620

Section 1 - Chemical Product and Company Identification

MSDS Name: Manganese (II) nitrate 50% solution, 5% nitric acid, 45% water

Catalog Numbers: S75155, S75735, S93299

Synonyms: Manganous nitrate solution.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10377-66-9	Manganese nitrate (anhydrous)	50	233-828-8
7732-18-5	Water	45	231-791-2
7697-37-2	Nitric acid	5	231-714-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-orange clear liquid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause severe eye irritation and possible injury. May cause severe skin irritation and possible burns. May cause severe respiratory and digestive tract irritation with possible burns. May cause lung damage. May cause central nervous system effects. May cause adverse reproductive effects.

Target Organs: Central nervous system, lungs, eyes, reproductive system, skin, mucous membranes.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: May cause severe skin irritation. Concentrated solutions may produce corrosive effects.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.

Inhalation: May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema.

Chronic: Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. May impair fertility.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash hands before eating. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Use only with adequate ventilation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from flammable liquids. Keep away from strong bases. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Manganese nitrate (anhydrous)	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.). 500 mg/m ³ IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).
Water	none listed	none listed	none listed
Nitric acid	2 ppm TWA; 4 ppm STEL	2 ppm TWA; 5 mg/m ³ TWA 25 ppm IDLH	2 ppm TWA; 5 mg/m ³ TWA

OSHA Vacated PELs: Manganese nitrate (anhydrous): No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical. Nitric acid: 2 ppm TWA; 5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear chemical splash goggles and face shield.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or

European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid

Appearance: red-orange

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: > 115 deg C

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 1.54

Molecular Formula: Mn(NO₃)₂

Molecular Weight: 178.9

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Excess heat.

Incompatibilities with Other Materials: Metals, reducing agents, strong bases, combustible materials.

Hazardous Decomposition Products: Nitrogen oxides, oxides of manganese, manganese fume.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10377-66-9: QU9780000

CAS# 7732-18-5: ZC0110000

CAS# 7697-37-2: QU5775000; QU5900000

LD50/LC50:

Not available.

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 7697-37-2:

Inhalation, rat: LC50 = 260 mg/m³/30M;

Inhalation, rat: LC50 = 130 mg/m³/4H;

Inhalation, rat: LC50 = 67 ppm(NO₂)/4H;

Carcinogenicity:

CAS# 10377-66-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7697-37-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The U.S. EPA stated that epidemiological studies of inorganic manganese compounds in humans indicate effects on the respiratory system at levels below 1 mg/m³.

Teratogenicity: No data available.

Reproductive Effects: Men exposed to manganese dusts showed a decrease in fertility.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: Manganese is neurotoxic.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING LIQUID, CORROSIVE, N.O.S.	MANGANESE NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN3098	UN2724
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10377-66-9 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 7697-37-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7697-37-2: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 7697-37-2: 1000 lb TPQ

SARA Codes

CAS # 10377-66-9: delayed, fire.

CAS # 7697-37-2: immediate, delayed, fire.

Section 313

This material contains Manganese nitrate (anhydrous) (listed as Manganese compounds, n.o.s.), 50%, (CAS# 10377-66-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Nitric acid (CAS# 7697-37-2, 5%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 10377-66-9 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7697-37-2 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

CAS# 7697-37-2 is considered highly hazardous by OSHA.

STATE

CAS# 10377-66-9 can be found on the following state right to know lists: California, (listed as Manganese compounds, n.o.s.), New Jersey, Pennsylvania, (listed as Manganese compounds, n.o.s.), Minnesota, (listed as Manganese compounds, n.o.s.).

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7697-37-2 can be found on the following state right to know lists: California, New

Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations European Labeling in Accordance with EC Directives Hazard Symbols:

O C

Risk Phrases:

R 34 Causes burns.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 23 Do not inhale gas/fumes/vapour/spray.

S 24/25 Avoid contact with skin and eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 38 In case of insufficient ventilation, wear suitable respiratory equipment.

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 10377-66-9: No information available.

CAS# 7732-18-5: No information available.

CAS# 7697-37-2: 1

Canada - DSL/NDSL

CAS# 10377-66-9 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 7697-37-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10377-66-9 (listed as Manganese compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 7697-37-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Manganese(II) Chloride, 98%

ACC# 82895

Section 1 - Chemical Product and Company Identification

MSDS Name: Manganese(II) Chloride, 98%

Catalog Numbers: S80070, S80070-1, S800701

Synonyms: Manganese chlorid; Manganese dichloride; Manganous chloride

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7773-01-5	Manganese(II) chloride	98.0	231-869-6

Hazard Symbols: XN

Risk Phrases: 22 36/37/38

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: pink crystals. Hygroscopic (absorbs moisture from the air). **Warning!**
Causes eye and skin irritation. May cause digestive tract irritation. Causes respiratory tract irritation. Harmful if swallowed. May cause reproductive and fetal effects. May cause central nervous system effects.

Target Organs: Lungs, nerves.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea,

vomiting and diarrhea. May cause central nervous system effects and/or neurological effects. In high doses, manganese may increase anemia by interfering with iron absorption.

Inhalation: Causes respiratory tract irritation. Can produce delayed pulmonary edema. Chronic inhalation hazard.

Chronic: Effects may be delayed. Chronic manganese toxicity through inhalation may result in "manganism", which is a disease of the central nervous system involving psychic and neurological disorders.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively. Persons with impaired respiratory function or anemia may be at increased risk to the hazards associated with this substance.

Antidote: No specific antidote exists.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe dust, vapor, mist, or gas. Keep container tightly closed. Do not ingest or inhale.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Manganese(II) chloride	none listed	none listed	none listed

OSHA Vacated PELs: Manganese(II) chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: pink
Odor: odorless
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 1190 deg C
Freezing/Melting Point:650 deg C
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:2.977
Molecular Formula:Cl₂Mn
Molecular Weight:125.844

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants, exposure to moist air or water.
Incompatibilities with Other Materials: Zinc, potassium, sodium, moisture, strong reducing agents, hydrogen peroxides.
Hazardous Decomposition Products: Hydrogen chloride, irritating and toxic fumes and gases, oxides of manganese.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7773-01-5: 009625000
LD50/LC50:
CAS# 7773-01-5:
Oral, mouse: LD50 = 1031 mg/kg;
Oral, mouse: LD50 = 450 mg/kg;
Oral, rat: LD50 = 250 mg/kg; <BR.

Carcinogenicity:
CAS# 7773-01-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: Intraperitoneal, mouse: TDLo = 2080 mg/kg/26W-I 9(Tumorigeni c - Carcinogenic by RTECS criteria - Blood - lymphoma, including Hodgkin's disease).
Teratogenicity: Oral, rat: TDLo = 148 gm/kg (female 1-22 day(s) after conception) Effects

on Newborn - growth statistics (e.g.%, reduced weight gain).; Intravenous, rat: TDLo = 45302 ug/kg (female 6-17 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) and Specific Developmental Abnormalities - musculoskeletal system.; Intraperitoneal, pig: TDLo = 4581 mg/kg (female 12-16 week(s) after conception) Specific Developmental Abnormalities - blood and lymphatic systems (including spleen and marrow).

Reproductive Effects: Oral, rat: TDLo = 106 mg/kg (female 30 week(s) pre-mating) Fertility - pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea).; Intratesticular, rat: TDLo = 10067 ug/kg (male 1 day(s) pre-mating) Paternal Effects - testes, epididymis, sperm duct.

Neurotoxicity: No information available.

Mutagenicity: DNA Damage: Human, Fibroblast = 20 mmol/L.; DNA Damage: Human, Lymphocyte = 1500 umol/tube.

Other Studies: No information available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7773-01-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

This material contains Manganese(II) chloride (listed as Manganese), 98.0%, (CAS# 7773-01-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7773-01-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7773-01-5: 1

Canada - DSL/NDSL

CAS# 7773-01-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.

Canadian Ingredient Disclosure List

CAS# 7773-01-5 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 7773-01-5: OEL-AUSTRALIA: TWA 5 mg(Mn)/m³ JANUARY 1993 OEL-BELGIUM: TWA 5 mg(Mn)/m³ JANUARY 1993 OEL-CZECHOSLOVAKIA: TWA 2 mg(Mn)/m³; STEL 6 mg(Mn)/m³ JANUARY 1993 OEL-DENMARK: TWA 2.5 mg(Mn)/m³ JANUARY 1993 OEL-FINLAND: TWA 2.5 mg(Mn)/m³ JANUARY 1993 OEL-HUNGARY: TWA 0.3 mg(Mn)/m³; STEL 0.6 mg(Mn)/m³ JANUARY 1993 OEL-JAPAN: TWA 0.3 mg(Mn)/m³ JANUARY 1993 OEL-THE NETHERLANDS: TWA 1 mg(Mn)/m³ JANUARY 1993 OEL-POLAND: TWA 0.3 mg(Mn)/m³ JANUARY 1993 OEL-SWEDEN: TWA 1 mg(Mn)/m³; STEL 2.5 mg(Mn)/m³ (resp. dust) OEL-SWEDEN: TWA 2.5 mg(Mn)/m³; STEL 5 mg(Mn)/m³ (total dust) OEL-UNITED KINGDOM: TWA 5 mg(Mn)/m³ JANUARY 1993 OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN N

Material Safety Data Sheet

Manganese(IV) dioxide

ACC# 13610

Section 1 - Chemical Product and Company Identification

MSDS Name: Manganese(IV) dioxide

Catalog Numbers: AC193470000, AC193470050, AC203190000, AC203190030, AC203190050, AC203191000, AC203195000, AC213490000, AC213490010, AC213490250, AC222580000, AC222580050, AC222580500, AC222581000, AC222585000, AC357790000, AC357790050, AC357790500, S75734, S75737, S93297, S93298, M108-500, NC9348319, NC9353110

Synonyms: Black manganese oxide; Manganese dioxide; Manganese(IV) oxide; Manganese peroxide; Manganese binoxide; Manganese black; Battery manganese; Manganese superoxide; occurs in nature as the mineral pyrolusite.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1313-13-9	Manganese dioxide	>80	215-202-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black crystalline powder.

Danger! Strong oxidizer. Contact with other material may cause a fire. Harmful if inhaled or swallowed. May cause eye, skin, and respiratory tract irritation. May cause central nervous system effects. Inhalation of fumes may cause metal-fume fever. May cause adverse reproductive effects based upon animal studies.

Target Organs: Central nervous system, lungs, reproductive system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts may cause CNS depression. In high doses, manganese may increase anemia by interfering with iron absorption. Although they are poorly absorbed through the intestine, inorganic manganese salts may produce hypoglycemia and decreased calcium blood levels should absorption occur.

Inhalation: May cause respiratory tract irritation. Harmful if inhaled. Aspiration may cause severe pneumonia. The lowest exposure concentration of manganese at which early effects on the CNS and the lungs may occur is still unknown. However, once neurological signs are present, they tend to continue and worsen after exposure ends.

Chronic: Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. Adverse reproductive effects have been reported in animals. Other chronic effects from inhaling high amounts of manganese include an increased incidence of cough and bronchitis and susceptibility to infectious lung disease.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe dust, mist, or vapor. Keep container tightly closed. Do not ingest or inhale. Keep from contact with clothing and other combustible materials. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Store in a cool, dry place. Store in a tightly closed container. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Manganese dioxide	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.).500 mg/m ³ IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).

OSHA Vacated PELs: Manganese dioxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: black

Odor: odorless

pH: 6.2 (1500 g/L aq.sol.)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: 535 deg C

Decomposition Temperature: 535 deg C

Solubility: Insoluble.

Specific Gravity/Density: 5.02

Molecular Formula: MnO₂

Molecular Weight: 86.94

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Organic matter, azides, hydrogen peroxide, sulfur, sulfides, phosphides, hypophosphites, strong reducing agents, combustible materials, aldehydes, alcohols, acids (mineral, non-oxidizing, e.g. hydrochloric acid, hydrofluoric acid, muriatic acid, phosphoric acid), acids (organic, e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid).

Hazardous Decomposition Products: Oxygen, oxides of manganese.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1313-13-9: OP0350000

LD50/LC50:

CAS# 1313-13-9:

Oral, rat: LD50 = >3478 mg/kg;

Carcinogenicity:

CAS# 1313-13-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The U.S. EPA stated that epidemiological studies of inorganic manganese compounds in humans indicate effects on the respiratory system at levels below 1 mg/m³.

Teratogenicity: No information available.

Reproductive Effects: Men exposed to manganese dusts showed a decrease in fertility.

Mutagenicity: No information found

Neurotoxicity: Manganese is neurotoxic.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, N.O.S.	OXIDIZING SOLID NOS (MANGANESE DIOXIDE)
Hazard Class:	5.1	5.1
UN Number:	UN1479	UN1479
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1313-13-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 1313-13-9: delayed, fire.

Section 313

This material contains Manganese dioxide (listed as Manganese compounds, n.o.s.), >80%, (CAS# 1313-13-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 1313-13-9 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1313-13-9 can be found on the following state right to know lists: California, (listed as Manganese compounds, n.o.s.), New Jersey, Pennsylvania, (listed as Manganese compounds, n.o.s.), Minnesota, (listed as Manganese compounds, n.o.s.).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

Safety Phrases:

S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 1313-13-9: 1

Canada - DSL/NDSL

CAS# 1313-13-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1313-13-9 (listed as Manganese compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Manganese(II) sulfate monohydrate

ACC# 13655

Section 1 - Chemical Product and Company Identification

MSDS Name: Manganese(II) sulfate monohydrate

Catalog Numbers: AC205900000, AC205900010, AC205900050, AC205905000, AC423910000, AC423910050, AC423915000, M113-3, M113-500, M114-12, M114-212, M114-500, M114SAM1, M114SAM2, M114SAM3, M115-12, M115-212, M115-500

Synonyms: Manganese(2+) sulfate, monohydrate; Manganous sulfate monohydrate; Sulfuric acid, manganese(2+) salt (1:1), monohydrate; Manganese, monosulfate, monohydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10034-96-5	Manganese(II) sulfate monohydrate	>98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: pink solid.

Warning! Harmful if inhaled or swallowed. May cause eye, skin, and respiratory tract irritation. May cause lung damage. May cause central nervous system effects. Hygroscopic (absorbs moisture from the air).

Target Organs: Central nervous system, lungs, reproductive system.

Potential Health Effects

Eye: May cause mild eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation. The lowest exposure concentration of manganese at which early effects on the CNS and the lungs may occur is still unknown. However, once neurological signs are present, they tend to continue and worsen after exposure ends.

Chronic: Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. May impair fertility. Other chronic effects from inhaling high amounts of manganese include an increased incidence of cough and bronchitis and susceptibility to infectious lung disease.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Remove contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Manganese(II) sulfate monohydrate	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.). 500 mg/m ³ IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).
Manganese(II) sulfate anhydrous	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.). 500 mg/m ³ IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).

OSHA Vacated PELs: Manganese(II) sulfate monohydrate: No OSHA Vacated PELs are listed for this chemical. Manganese(II) sulfate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear impervious gloves.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: pink
Odor: odorless
pH: 3-3.5 (50 g/l @ 20°C)
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 850 deg C
Freezing/Melting Point: 700 deg C
Decomposition Temperature: 850 deg C
Solubility: Completely soluble in water.
Specific Gravity/Density: 3.25 g/cm³
Molecular Formula: MnSO₄.H₂O
Molecular Weight: 169.02

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation, moisture, confined spaces.
Incompatibilities with Other Materials: Can react with strong acid, strong oxidizing agents, powdered metals; may react violently with hydrogen peroxide.
Hazardous Decomposition Products: Oxides of sulfur, oxides of manganese.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 10034-96-5: OP0893500
CAS# 7785-87-7: OP1050000
LD50/LC50:
Not available.

CAS# 7785-87-7:
Oral, mouse: LD50 = 2330 mg/kg;
Oral, rat: LD50 = 2150 mg/kg;

Carcinogenicity:

CAS# 10034-96-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7785-87-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The U.S. EPA stated that epidemiological studies of inorganic manganese compounds in humans indicate effects on the respiratory system at levels below 1 mg/m³.

Teratogenicity: No data available.

Reproductive Effects: Men exposed to manganese dusts showed a decrease in fertility.

Mutagenicity: No data available.

Neurotoxicity: Manganese is neurotoxic.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	Not Regulated
Hazard Class:	9	
UN Number:	UN3077	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10034-96-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7785-87-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10034-96-5: delayed.

CAS # 7785-87-7: delayed.

Section 313

This material contains Manganese(II) sulfate monohydrate (listed as Manganese compounds, n.o.s.), >98%, (CAS# 10034-96-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Manganese(II) sulfate anhydrous (listed as Manganese compounds, n.o.s.), -%, (CAS# 7785-87-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 10034-96-5 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

CAS# 7785-87-7 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10034-96-5 can be found on the following state right to know lists: California, (listed as Manganese compounds, n.o.s.), New Jersey, (listed as Manganese compounds, n.o.s.), Pennsylvania, (listed as Manganese compounds, n.o.s.), Minnesota, (listed as Manganese compounds, n.o.s.).

CAS# 7785-87-7 can be found on the following state right to know lists: California, (listed as Manganese compounds, n.o.s.), New Jersey, (listed as Manganese compounds, n.o.s.), Pennsylvania, (listed as Manganese compounds, n.o.s.), Minnesota, (listed as Manganese compounds, n.o.s.).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 48/20/22 Harmful : danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 10034-96-5: 1

CAS# 7785-87-7: 1

Canada - DSL/NDSL

CAS# 7785-87-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10034-96-5 (listed as Manganese compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 7785-87-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Manganese(II) chloride tetrahydrate

ACC# 13600

Section 1 - Chemical Product and Company Identification

MSDS Name: Manganese(II) chloride tetrahydrate

Catalog Numbers: S80070, S800701, M87-100, M87-500, M87-500LC

Synonyms: Manganous chloride tetrahydrate; Manganese dichloride tetrahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13446-34-9	Manganese(II) chloride tetrahydrate	>98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: reddish solid.

Warning! Harmful to aquatic organisms; may cause long-term adverse effects in the aquatic environment. Danger of serious damage to health by prolonged exposure if swallowed.

Target Organs: Central nervous system, lungs, reproductive system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system effects and/or neurological effects. In high doses, manganese may increase anemia by interfering with iron absorption.

Inhalation: May cause respiratory tract irritation. The lowest exposure concentration of manganese at which early effects on the CNS and the lungs may occur is still unknown. However, once neurological signs are present, they tend to continue and worsen after exposure ends.

Chronic: Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. May impair fertility. Other chronic effects from inhaling high amounts of manganese include an increased incidence of cough and bronchitis and susceptibility to infectious lung disease.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively. Persons with impaired respiratory function or anemia may be at increased risk to the hazards associated with this substance.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Non-flammable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.
Storage: Keep container closed when not in use. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Manganese(II) chloride tetrahydrate	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.). 500 mg/m ³ IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).
Manganese(II) chloride anhydrous	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.). 500 mg/m ³ IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).

OSHA Vacated PELs: Manganese(II) chloride tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Manganese(II) chloride anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and

ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: reddish
Odor: none reported
pH: 5.5 (0.2M aq soln)
Vapor Pressure: Not applicable.
Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: 58 deg C
Decomposition Temperature: Not available.
Solubility: Freely Soluble.
Specific Gravity/Density: 2.01 g/cm³
Molecular Formula: MnCl₂·4H₂O
Molecular Weight: 197.91

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Deliquescent (tending to absorb atmospheric water vapor and become liquid).
Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Zinc, potassium, sodium.
Hazardous Decomposition Products: Hydrogen chloride, irritating and toxic fumes and gases, oxides of manganese.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 13446-34-9: 009650000
CAS# 7773-01-5: 009625000
LD50/LC50:
CAS# 13446-34-9:
Oral, rat: LD50 = 1484 mg/kg;

CAS# 7773-01-5:

Oral, mouse: LD50 = 1031 mg/kg;

Oral, mouse: LD50 = 450 mg/kg;

Oral, rat: LD50 = 250 mg/kg;

Carcinogenicity:

CAS# 13446-34-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7773-01-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The U.S. EPA stated that epidemiological studies of inorganic manganese compounds in humans indicate effects on the respiratory system at levels below 1 mg/m3.

Teratogenicity: No data available.

Reproductive Effects: Men exposed to manganese dusts showed a decrease in fertility.

Mutagenicity: No data available.

Neurotoxicity: Manganese is neurotoxic.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13446-34-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7773-01-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 13446-34-9: delayed.

Section 313

This material contains Manganese(II) chloride tetrahydrate (listed as Manganese compounds, n.o.s.), >98%, (CAS# 13446-34-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Manganese(II) chloride anhydrous (listed as Manganese compounds, n.o.s.), -%, (CAS# 7773-01-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 13446-34-9 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

CAS# 7773-01-5 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 13446-34-9 can be found on the following state right to know lists: California, (listed as Manganese compounds, n.o.s.), New Jersey, (listed as Manganese compounds, n.o.s.), Pennsylvania, (listed as Manganese compounds, n.o.s.), Minnesota, (listed as Manganese compounds, n.o.s.).

CAS# 7773-01-5 can be found on the following state right to know lists: California,

(listed as Manganese compounds, n.o.s.), New Jersey, (listed as Manganese compounds, n.o.s.), Pennsylvania, (listed as Manganese compounds, n.o.s.), Minnesota, (listed as Manganese compounds, n.o.s.).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 52 Harmful to aquatic organisms.

R 48/22 Harmful : danger of serious damage to health by prolonged exposure if swallowed.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 13446-34-9: No information available.

CAS# 7773-01-5: 1

Canada - DSL/NDSL

CAS# 7773-01-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 13446-34-9 (listed as Manganese compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 7773-01-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Martius yellow, biological stain and chemical indicator

ACC# 89328

Section 1 - Chemical Product and Company Identification

MSDS Name: Martius yellow, biological stain and chemical indicator

Catalog Numbers: AC189490000, AC189490250

Synonyms: Acid Yellow 24; C.I. 10315; 2,4-Dinitro-1-naphthol; 1-Naphthalenol, 2,4-dinitro-; 1-Naphthol, 2,4-dinitro-; 2,4-Dinitro-1-naftol; 2-4 Dinitro-alpha-naphtol; Saffron Yellow

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
605-69-6	Martius yellow, biological stain and chemical indicator	ca. 100	210-093-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light brown powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Contact with skin causes pupils to dilate. Absorption through the skin causes nausea, vomiting and insomnia.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this

substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Martius yellow, biological stain and chemical indicator	none listed	none listed	none listed

OSHA Vacated PELs: Martius yellow, biological stain and chemical indicator: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: light brown

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 130.00 - 133.00 deg C

Decomposition Temperature: Not available.

Solubility: soluble
Specific Gravity/Density: Not available.
Molecular Formula: C₁₀H₆N₂O₅
Molecular Weight: 234.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide, nitrogen gas.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 605-69-6: QL3850000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 605-69-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	DYE SOLID TOXIC NOS
Hazard Class:		6.1
UN Number:		UN3143
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 605-69-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 605-69-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 605-69-6: No information available.

Canada - DSL/NDSL

CAS# 605-69-6 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

m-Cresol, 97%

ACC# 95808

Section 1 - Chemical Product and Company Identification

MSDS Name: m-Cresol, 97%

Catalog Numbers: AC110580000, AC110580010, AC110580250, AC110585000

Synonyms: 3-Methylphenol; m-Hydroxytoluene; m-Cresylic Acid; 1-Hydroxy-3-Methylbenzene; 3-Cresol.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
108-39-4	m-Cresol	97	203-577-9
7732-18-5	Water	<0.2	231-791-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light yellow to light pink liquid. Flash Point: 86 deg C.

Danger! Corrosive. Causes eye and skin burns. Causes digestive and respiratory tract burns. Harmful if swallowed or absorbed through the skin. **Combustible liquid and vapor.** May be harmful if inhaled. May cause central nervous system effects. Air sensitive. Hygroscopic (absorbs moisture from the air). Light sensitive. May cause liver and kidney damage. Marine pollutant.

Target Organs: Kidneys, central nervous system, liver, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury. May cause conjunctivitis and keratitis.

Skin: Harmful if absorbed through the skin. May cause dermatitis. Causes severe skin irritation and burns. Allergic reactions have been reported. When it comes in contact with the skin, it may not produce any burning sensation immediately.

Ingestion: Harmful if swallowed. May cause severe gastrointestinal tract irritation with

nausea, vomiting and possible burns. May cause liver and kidney damage. May cause central nervous system depression, convulsions, coma, and possible death due to respiratory paralysis.

Inhalation: Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause effects similar to those described for ingestion. Inhalation of appreciable amounts of vapor under normal conditions is unlikely because of the material's low vapor pressure. Hazardous concentrations may develop at elevated temperatures.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause digestive tract disturbances. Repeated exposure may cause central nervous system damage.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Combustible liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 86 deg C (186.80 deg F)

Autoignition Temperature: 558 deg C (1,036.40 deg F)

Explosion Limits, Lower: 1-1.4%

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Provide ventilation. Approach spill from upwind. U.S. regulations require reporting spills and releases to soil, water and air in excess of reportable quantities. Control runoff and isolate discharged material for proper disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Discard contaminated shoes. Use only with adequate ventilation. Keep away from heat and flame.

Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Store protected from light and air. Separate from oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
m-Cresol	5 ppm TWA; skin - potential for cutaneous absorption	2.3 ppm TWA; 10 mg/m ³ TWA 250 ppm IDLH	none listed
Water	none listed	none listed	none listed

OSHA Vacated PELs: m-Cresol: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: light yellow to light pink
Odor: phenolic
pH: Not available.
Vapor Pressure: 1 mm Hg @ 52 deg C
Vapor Density: 3.72 (Air=1)
Evaporation Rate:Not available.
Viscosity: 20.8cP @ 20C
Boiling Point: 203 deg C
Freezing/Melting Point:11 deg C
Decomposition Temperature:Not available.
Solubility: 23 g/L @ 25°C
Specific Gravity/Density:1.03
Molecular Formula:C7H8O
Molecular Weight:108.14

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Darkens on exposure to light and air.

Conditions to Avoid: Light, ignition sources, excess heat, prolonged exposure to air.

Incompatibilities with Other Materials: Oxidizing agents, strong acids, aluminum, brass, bronze, aliphatic amines, amides (e.g. butyramide, diethyltoluamide, dimethyl formamide), chlorosulfonic acid, oleum, alkalies.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, formaldehyde.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 108-39-4: GO6125000

CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 108-39-4:

Draize test, rabbit, eye: 103 mg Severe;

Draize test, rabbit, skin: 517 mg/24H Severe;

Inhalation, rat: LC50 = >710 mg/m³/1H;

Inhalation, rat: LC50 = 58 mg/m³;

Oral, mouse: LD50 = 828 mg/kg;

Oral, mouse: LD50 = 600 mg/kg;

Oral, rabbit: LD50 = 1400 mg/kg;

Oral, rat: LD50 = 242 mg/kg;

Oral, rat: LD50 = 825 mg/kg;

Oral, rat: LD50 = 242 mg/kg;
Skin, rabbit: LD50 = 2050 mg/kg;
Skin, rabbit: LD50 = 620 mg/kg;
Skin, rat: LD50 = 1100 mg/kg;
Skin, rat: LD50 = 1000
CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg; <BR.

Carcinogenicity:

CAS# 108-39-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: 7 workers exposed to cresol vapor for 1.5-3 yrs experienced headaches with nausea and vomiting. 4 of these workers also had elevated blood pressure, signs of impaired kidney function, blood calcium imbalance, and marked tremors.

Teratogenicity: No data available.

Reproductive Effects: See actual entry in RTECS for complete information.

Neurotoxicity: No data available.

Mutagenicity: See actual entry in RTECS for complete information.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: In air, cresols quickly break down into other chemicals. Cresols do not evaporate quickly from water, but they can be removed by bacteria. Cresols may last longer in deep groundwater or water that does not have bacteria. In soil, half the total amount of cresols will break down in about a week. Cresols do not appear to accumulate in fish or meat.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CRESOLS, LIQUID	CRESOL
Hazard Class:	6.1	6.1(8)
UN Number:	UN2076	UN2076
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 108-39-4 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 108-39-4: Effective 10/4/82, Sunset 10/4/92

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 108-39-4: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 108-39-4: acute, chronic, flammable.

Section 313

This material contains m-Cresol (CAS# 108-39-4, 97%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 108-39-4 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 108-39-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 108-39-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T C

Risk Phrases:

R 34 Causes burns.

R 24/25 Toxic in contact with skin and if swallowed.

Safety Phrases:

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 108-39-4: 2

CAS# 7732-18-5: No information available.

Canada - DSL/NDSL

CAS# 108-39-4 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, D1A, E.

Canadian Ingredient Disclosure List

CAS# 108-39-4 is listed on the Canadian Ingredient Disclosure List.

BOEHRINGER MANNHEIM CORP -- MERCURIC NITRATE -- 6810-00F031505

=====
Product Identification
=====

Product ID:MERCURIC NITRATE
MSDS Date:03/11/1985
FSC:6810
NIIN:00F031505
MSDS Number: BSNNY
=== Responsible Party ===
Company Name:BOEHRINGER MANNHEIM CORP
Address:9115 HAGUE RD
Box:50100
City:INDIANAPOLIS
State:IN
ZIP:46250
Country:US
Info Phone Num:317-845-2000/317-845-2684
Emergency Phone Num:317-845-2000/317-845-2684
Preparer's Name:DALE MARTIN
CAGE:32239
=== Contractor Identification ===
Company Name:BOEHRINGER MANNHEIM CORPORATION
Address:9115 HAGUE RD
Box:50414
City:INDIANAPOLIS
State:IN
ZIP:46250-0100
Country:US
Phone:317-845-2000
CAGE:32239

=====
Composition/Information on Ingredients
=====

Ingred Name:MERCURIC NITRATE
CAS:10045-94-0
RTECS #:OW8225000
Other REC Limits:0.05 MG/CUM
ACGIH TLV:100 UG/CUMM
EPA Rpt Qty:10 LBS
DOT Rpt Qty:10 LBS

Ingred Name:NITRIC ACID, HYDROGEN NITRATE
CAS:7697-37-2
RTECS #:QU5775000
OSHA PEL:5 MG/CUM
ACGIH TLV:5.2 MG/CUM
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

=====
Hazards Identification
=====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:POSITION. MAY BE FATAL IF INGESTED.
POISONING CAN OCCUR BY INHALATION/SKIN ABSORPTION. IRRITATES EYES,
NOSE, THROAT & SKIN. SEVERE BURNS OF EYES W/PERMANENT DAMAGE &

INJURY. NITRIC ACID: STAIN SKIN BRIG HT YELLOW W/BURNS & ULCERS.
INGESTION: IMMEDIATE PAIN & BURNS OF MOUTH, THROAT & STOMACH.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:MERCURY FROM MERCURIC NITRATE WILL BIND TO
PLASMA PROTEINS. SEVERE BREATHING DIFFICULTIES. MERCURY,
PARTICULARLY ORGANIC FORMS, IS KNOWN TO ADVERSELY AFFECT THE FETUS
IF THE MOTHER IS EXPOSED DURING P REGANCY.
Medical Cond Aggravated by Exposure:NITRIC ACID: IMPAIRED PULMONARY
FUNCTION OR EYE PROBLEMS.

=====
===== First Aid Measures =====

First Aid:EYES/SKIN: FLUSH W/WATER FOR 15 MINS. INHALATION: REMOVE TO
FRESH AIR. IF BREATHING STOPS, GIVE ARTIFICIAL RESPIRATION.
INGESTION: IF CONSCIOUS, INDUCE VOMITING W/SYRUP OF IPECAC OR
PLENTY OF WATER TO DILUTE. DON'T INDUCE VOMITING. OBTAIN MEDICAL
ATTENTION IN ALL CASES.

=====
===== Fire Fighting Measures =====

Extinguishing Media:ANY MEDIUM SUITABLE FOR SUPPORTING MATERIALS
Fire Fighting Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS.
Unusual Fire/Explosion Hazard:WILL SUBLIME. DANGEROUS FIRE RISK IN
CONTACT W/ORGANIC MATERIALS. FLAMMABLE OXIDIZER, CORROSIVE.

=====
===== Accidental Release Measures =====

Spill Release Procedures:VENTILATE AREA. CAREFULLY COLLECT MATERIAL &
PLACE IN SPECIALLY MARKED CONTAINERS WHICH ARE SUITABLE FOR
MERCURIC COMPOUNDS. DON'T FLUSH INTO SEWER.

=====
===== Handling and Storage =====

Other Precautions:DON'T WEAR CONTACT LENSES.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH APPROVED RESPIRATOR, ORGANIC VAPOR,
NON-OXIDIZABLE SORBENTS
Ventilation:GENERAL ROOM IS ADEQUATE. LOCAL WHEN NECESSARY.
Protective Gloves:IMPERVIOUS
Eye Protection:SPLASH-PROOF SAFETY GOGGLES
Other Protective Equipment:SAFETY SHOWER & EYEWASH; USE A SAFETY PIPET
DEVICE
Supplemental Safety and Health
INCOMPATIBILITY: HYDROGEN SULFIDE, TURPENTINE, PHOSPHINE, COMBUSTIBLE
ORGANICS. REACTS VIOLENTLY W/ACETIC ACID, ACETIC ANHYDRIDE. NITRIC
ACID WILL ATTACK SOME FORMS OF PLASTIC, RUBBER, & COATINGS.

=====
===== Physical/Chemical Properties =====

Solubility in Water:COMPLETE

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
HYPOPHOSPHORIC ACID, UNSATURATES, AROMATICS, ACETYLENE, ETHANOL, STRONG

BASES, METALLIC POWDERS, CARBIDE (SEE SUPP)
Stability Condition to Avoid:HEAT
Hazardous Decomposition Products:MERCURY VAPOR, OXIDES OF NITROGEN

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN APPROVED HAZARDOUS LANDFILL OR TO
A MERCURY RECOVERY FIRM IN ACCORDANCE W/FEDERAL, STATE & LOCAL
REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

HACH CO. -- MERCURIC NITRATE STANDARD SOLUTION 0.0141 N,285-16/46 -- 6810-00-499-5280

=====
===== Product Identification =====

Product ID:MERCURIC NITRATE STANDARD SOLUTION 0.0141 N,285-16/46
MSDS Date:04/19/1994
FSC:6810
NIIN:00-499-5280
MSDS Number: BYCLN
=== Responsible Party ===
Company Name:HACH CO.
Address:100 DAYTON RD.
Box:907
City:AMES
State:IA
ZIP:50010
Country:US
Info Phone Num:800-227-4224
Emergency Phone Num:800-227-4224/303-623-5714;R.M.POISN
CAGE:4T252

==== Contractor Identification ===

Company Name:HACH CO
Address:5600 LINDBERGH DR
Box:389
City:LOVELAND
State:CO
ZIP:80539
Country:US
Phone:970-669-3050/ 303-623-5716
CAGE:91224
Company Name:HACH COMPANY
Address:100 DAYTON RD.
Box:907
City:AMES
State:IA
ZIP:50010
Country:US
Phone:800-227-4224
CAGE:4T252

=====
===== Composition/Information on Ingredients =====

Ingred Name:MERCURIC NITRATE MONOHYDRATE
CAS:7783-34-8
Fraction by Wt: <1%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:0.01 MG HG/M3
ACGIH TLV:0.01 MG HG/M3

Ingred Name:NITRIC ACID (SARA 302/313) (CERCLA)
CAS:7697-37-2
RTECS #:QU5775000
Fraction by Wt: <1%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:2 PPM
ACGIH TLV:2 PPM/4 STEL; 9495

EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:WATER
CAS:7732-18-5
RTECS #:ZC0110000
Fraction by Wt: TO 100%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:NOT RELEVANT
ACGIH TLV:NOT RELEVANT

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD5

=====
Fire Fighting Measures
=====

Flash Point:NONE
Extinguishing Media:WATER SPRAY, CARBON DIOXIDE, SAND, FOAM/DRY
CHEMICAL. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS
COOL.
Fire Fighting Procedures:WEAR FULL PROTECTIVE CLOTHING AND
NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL
FACEPIECE OPERATED IN THE POSITIVE PRESSURE MODE.
Unusual Fire/Explosion Hazard:MAY EMIT TOXIC FUMES OF MERCURY AND
NITROGEN OXIDES.

=====
Exposure Controls/Personal Protection
=====

Supplemental Safety and Health

=====
Physical/Chemical Properties
=====

HCC:C1
NRC/State Lic Num:NOT RELEVANT
Decomp Temp:Decomp Text:NOT KNOWN
Spec Gravity:1.0015
pH:1.75
Solubility in Water:SOLUBLE
Appearance and Odor:CLEAR, COLORLESS LIQUID

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid:YES
ALKALIES
Stability Condition to Avoid:HEAT, EVPORATION
Hazardous Decomposition Products:MAY EMIT TOXIC FUMES OF MERCURY AND
NITROGEN OXIDES.

=====
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assume responsibility for the suitability of this information to their
particular situation.
=====

J.T. BAKER INC. -- 2620,2622 MERCURIC OXIDE,RED -- 6810-00-247-0599

=====
===== Product Identification =====

Product ID:2620,2622 MERCURIC OXIDE,RED
MSDS Date:05/01/1989
FSC:6810
NIIN:00-247-0599
MSDS Number: BPKKF
=== Responsible Party ===
Company Name:J.T. BAKER INC.
Address:222 RED SCHOOL LANE
City:PHILLPSBURG
State:NJ
ZIP:08865
Country:US
Info Phone Num:201-859-2151
Emergency Phone Num:908-859-2151/800-424-9300 (CHEMTREC)
CAGE:HO785

==== Contractor Identification ===

Company Name:J.T. BAKER INC.
Address:222 RED SCHOOL LANE
Box:City:PHILLIPSBURG
State:NJ
ZIP:08865
Country:US
Phone:202-483-7616
CAGE:HO785
Company Name:MALLINCKRODT BAKER, INC.
Address:222 RED SCHOOL LANE
Box:City:PHILLIPSBURG
State:NJ
ZIP:08865
Country:US
Phone:800-582-2537
CAGE:70829

=====
===== Composition/Information on Ingredients =====

Ingred Name:MERCURIC OXIDE (SARA III)
CAS:21908-53-2
RTECS #:OW8750000
Fraction by Wt: 90-100%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:0.1 MG HG/M3;SKIN;C
ACGIH TLV:0.1 MG HG/M3; 9293

=====
===== Hazards Identification =====

LD50 LC50 Mixture:TLV/TWA:0.1MG/M3,ORAL,RAT LD50:18MG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:POISON!MAY BE FATAL IF
SWALLOWED/INHALED/ABSORBED THRU SKIN. CHRONIC EFFECT:MERCURY
BUILD-UP IN BRAIN, LIVER, KIDNESY, HEADACHE, SHAKES, LOOSE TEETH,
LOSS OF APPETITE, SKIN ULCERATION, IMPAIRED MEMORY .

Explanation of Carcinogenicity:PER

MSDS:CARCINOGENICITY:NTP/IARC/OSHA:NO. NONE IDENTIFIED.

Effects of Overexposure:INHAL:MAY BE FATAL,TIGHTNESS/PAIN IN CHEST,COUGHING,DIFFI BREATH.SKIN:SEVERE IRRIT/BURNS,PROLON CONTACT MAY CAUSE SKIN SENS.EYE:SEVERE IRRIT/BURNS,PROLON CONTACT MAY CAUSE PERM CORNEAL DMG,BLINDNESS.S KIN ABSORPTION:MAY BE FATAL,RAPID ABSORPTION.INGEST:MAY BE FATATL,NAU,VOMIT,GI IRRIT,MOUTH/THROAT BURNS.

Medical Cond Aggravated by Exposure:ALLERGIES,CHRONIC RESP DISEASE,NERVE SYS DISORDERS,KIDNEY DISORDERS. TARGET ORGANS:EYES, SKIN, RESP SYSTE, CENTRAL NERVOUS SYSTEM, KIDNEYS.

=====
===== First Aid Measures =====

First Aid:INGEST:CALL PHYSICIAN.IF CONSC IMMED INDUCE VOMIT.
INHAL:REMOVE TO FRESH AIR.NOT BREATH GIVE ART RESP.DIFFI BREATH GIVE OXY. SKIN:IMMED FLUSH W/PLENTY OF WATER FOR @LEAST 15MINS WHILE REMOVING CONTAMI N CLOTH/SHOES. EYE:IMMED FLUSH W/PLENTYOF WATER FOR @LEAST 15MINS.

=====
===== Fire Fighting Measures =====

Flash Point Method:CC
Extinguishing Media:USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.
Fire Fighting Procedures:FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQPMT & SELF-CONTAINED BREATHING APPARATUS W/FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.
Unusual Fire/Explosion Hazard:NOTE:DECOMPOSES @ MELTING POINT (500C).CAN REACT VIOLENTLY W/SHOCK, FRICTION,OR HEAT.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR SCBA & FULL PROT CLOTH.W/CLEAN SHOVEL CAREFULLY PLACE MATL INTO CLEAN DRY CNTNR & COVER.REMOVE FRM AREA.FLUSH APILL AREA W/WATER.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:KEEP PRODUCT OUT OF LIGHT.KEEP CNTNR TIGHTLY CLOSED.STORE IN SECURE POISON AREA.STORE IN LIGHT-RESISTANT CNTNRS.
Other Precautions:SAF-T-DATA STORAGE COLOR CODE:BLUE(HEALTH).

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION EXCEEDS TLV A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.
Ventilation:USE GENERAL/LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.
Protective Gloves:PROPER GLOVES ARE RECOMMENDED.
Eye Protection:SAFETY GOGGLES ARE RECOMMENDED.
Other Protective Equipment:UNIFORM & APRON ARE RECOMMENDED.
Work Hygienic Practices:WASH CONTAMIN CLOTH BEF REUSE.
Supplemental Safety and Health

NONE

===== Physical/Chemical Properties =====

HCC:T3
Melt/Freeze Pt:M.P/F.P Text:932F,500C
Decomp Temp:Decomp Text:932F,500C
Spec Gravity:11.1
Evaporation Rate & Reference:0.6 (N-BUTYL ACETATE=1)
Solubility in Water:NEGLIGIBLE <0.1%.
Appearance and Odor:ORANGE TO RED POWDER, ODORLESS, SOLID.
Percent Volatiles by Volume:0

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG REDUCING AGENTS,STRONG OXIDIZING AGENTS,AMINES,COMBUSTIBLE
MATLS,ORGANIC MATLS,PHENOL.
Stability Condition to Avoid:LIGHT, HEAT.
Hazardous Decomposition Products:MECURY FUMES, CARBON MONOXIDE AND
CARBON DIOXIDE

===== Disposal Considerations =====

Waste Disposal Methods:CONTAINS CERCLA/SARA 313 CHEMS.CONTAINS MERCURY
RQ=1LB.DISPOSE IAW ALL APPLICABLE FED/STATE/LOC ENVIRONMENTAL
REGS.EPA HAZ WASTE #:D009(EPA TOXIC WASTE).

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assume responsibility for the suitability of this information to their
particular situation.

HACH COMPANY -- MERCURIC SULFATE; CAT.NO.1915 -- 6810-01-242-7774

=====
===== Product Identification =====

Product ID:MERCURIC SULFATE; CAT.NO.1915

MSDS Date:09/12/1985

FSC:6810

NIIN:01-242-7774

MSDS Number: BGRFZ

=== Responsible Party ===

Company Name:HACH COMPANY

Address:100 DAYTON RD

Box:907

City:AMES

State:IA

ZIP:50010

Country:US

Info Phone Num:303-669-3050

Emergency Phone Num:515-232-2533

CAGE:4T252

=== Contractor Identification ===

Company Name:HACH CO

Address:5600 LINDBERGH DR

Box:389

City:LOVELAND

State:CO

ZIP:80539

Country:US

Phone:970-669-3050/ 303-623-5716

CAGE:91224

Company Name:HACH COMPANY

Address:100 DAYTON RD.

Box:907

City:AMES

State:IA

ZIP:50010

Country:US

Phone:800-227-4224

CAGE:4T252

=====
===== Composition/Information on Ingredients =====

Ingred Name:MERCURIC SULFATE (SARA III)

CAS:7783-35-9

RTECS #:OX0500000

Fraction by Wt: <100%

OSHA PEL:0.1 MG HG/M3;SKIN;C

ACGIH TLV:0.1 MG HG/M3; 9192

EPA Rpt Qty:10 LBS

DOT Rpt Qty:10 LBS

Ingred Name:WATER

CAS:7732-18-5

RTECS #:ZC0110000

Fraction by Wt: <2.0%

=====
===== Hazards Identification =====

LD50 LC50 Mixture:57 MG/KG ORAL RAT
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:COMPOUND IS BOTH CORROSIVE AND TOXIC.
**MERCURY COMPOUNDS ARE EXCREATED VERY SLOWLY AND A LOW LEVEL
OVEREXPOSURE CAN LEAD TO A BUILD UP OF TOXIC LEVELS IN THE BODY**
Effects of Overexposure:IRRITATION AND BURNS TO EXPOSED TISSUE. KIDNEY
FAILURE
Medical Cond Aggravated by Exposure:NONE

===== First Aid Measures =====

First Aid:INHAL:RMV TO FRESH AIR. IF NOT BRTHNG GIVE CPR; IF BRTHNG
DIFF GIVE OXYGEN. EYE:IMMED FLUSH W/PLENTY OF WATER. SKIN:WASH
W/SOAP&WATER. RMV CONTAM CLTHG&SHOES. INGEST:INDUCE VOMIT. RPT
UNTIL VOMIT IS CLEAR. NOTHG BY MOUTH IF UNCONSC. GET MEDICAL ATTN.

===== Fire Fighting Measures =====

Flash Point:NON-FLAMMABLE
Extinguishing Media:DRY CHEMICAL
Fire Fighting Procedures:WEAR CHEMICAL PROTECTIVE SUIT WITH SELF CONTD
BRTHG APP.
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES WHEN HEATED

===== Accidental Release Measures =====

Spill Release Procedures:CONTAIN SPILL. SWEEP UP,BEING CAREFUL TO
MINIMIZE DUST. WEAR APPROPRIATE PROTECTIVE EQUIPMENT.
Neutralizing Agent:NONE

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN COOL DRY AREA. PROTECT FROM
MOISTURE. KEEP CONTAINERS CLOSED.PROTECT FROM LIGHT
Other Precautions:PROTECT FM MOISTURE.WASH THOROUGHLY AFTER
HANDLING.AVOID CONTACT WITH EYES,SKIN & CLOTHING.DO NOT BREATHE
CHEMICALS.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:IF EXPOS TLV,NIOSH/MESA APPR SELF-CNTND BRTHG
APP (POS PR MODE)
Ventilation:LOCAL EXHAUST TO MAINTN BELOW TLV.
Protective Gloves:RUBBER/NEOPRENE
Eye Protection:SAFETY GLASSES
Other Protective Equipment:SAFETY SHOWER & EYE BATH
Work Hygienic Practices:PRACTICE STRICT CHEMICAL HYGIENE. WASH
IMMEDIATELY AFTER CONTACT AND IMMEDIATELY CHANGE CONTAMINATED
CLOTHING.
Supplemental Safety and Health
MSDS FROM HACH COMPANY EFFECTIVE:9/12/85

===== Physical/Chemical Properties =====

HCC:T3

Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES
Spec Gravity:6.47
Solubility in Water:DECOMPOSES
Appearance and Odor:WHITE CRYSTALLINE SOLID, NO ODOR

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NONE
Stability Condition to Avoid:EXCESSIVE HEAT, FLAME, LIGHT
Hazardous Decomposition Products:FUMES OF MERCURY AND SO*2, SO*3

===== Disposal Considerations =====

Waste Disposal Methods:DO NOT RELEASE MERCURY COMPOUNDS TO THE
ENVIRONMENT. CHECK WITH EPA FOR CURRENT DISPOSAL METHOD.

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particular situation.

FISHER SCIENTIFIC, CHEMICAL DIV. -- M159100, MERCUROUS CHLORIDE -- 6810-00N026765

=====
Product Identification
=====

Product ID:M159100, MERCUROUS CHLORIDE
MSDS Date:05/01/1991
FSC:6810
NIIN:00N026765
MSDS Number: BPJRH
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100 OR 201-796-7523
Emergency Phone Num:201-796-7100/800-424-9300 (CHEMTREC)
CAGE:1B464

==== Contractor Identification ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:ING 19:DIMERCAPROL COMPLEX. PENICILLAMINE IS ALSO EFTIVE.
GIVE UP TO 100 MG/KG/DAY (MAX 1 GR/DAY) DIVIDED INTO (ING 21)
RTECS #:9999999ZZ

Ingred Name:ING 20:4 DOSES FOR NO LONGER THAN 1 WEEK. IF LONGER ADMIN
PERIOD NEEDED DOSAGE SHOULD NOT EXCEED 40 MG/KG/DAY. (ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 21:GIVE DRUG ORALLY 1/2 HR BEFORE MEALS. CHELATING
AGENT SHOULD BE CONTINUED UNTIL URINE-MERCURY LEVEL FALLS (ING 23)
RTECS #:9999999ZZ

Ingred Name:ING 22:BELOW 50/UG/24 HRS. ANTIDOTE SHOULD BE ADMINISTERED
BY QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

Ingred Name:SPILL PROC:FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE
AWAY. ISOLATE HAZARD AREA AND DENY ENTRY.
RTECS #:9999999ZZ

Ingred Name:ING 4:CHARACT FEATURES INCLDG INFLAMM OF MOUTH, MUSC
TREMORS & PSYCHIC DISTURB. MERCURIALISM BEGINS W/PROGRESSIVE (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:NUMBNESS OF DISTAL PARTS OF EXTREMITIES. MUSC COORD

SUFFERS & GENERALIZED MUSC WEAKNESS, TREMORS & PAIN MAY (ING 7)
RTECS #:9999999ZZ

Ingrid Name:ING 6:OBSERVED. ATAXIA, DYSARTHRIA, DYSPHAGIA & DEAFNESS
MAY BE EXPER. SLURRING SPEECH, LOSS OF EMOTIONAL CONTROL(ING 8)
RTECS #:9999999ZZ

Ingrid Name:ING 7:& STUPOR, COMA, BLURRING OF VISION, CONSTRICTION OF
VISUAL FIELD, TUNNEL VISION & BLINDNESS, ABNORM INVOLUNTARY(ING 9)
RTECS #:9999999ZZ

Ingrid Name:ING 8:MOVEMENTS, PSYCHIC DISTURB, ERETHISM MAY OCCUR.
SKIN:DERM. ABSORP MAY LEAD TO SYMPS AS IN CHRONIC INHAL. (ING 10)
RTECS #:9999999ZZ

Ingrid Name:ING 9:EYE:CONJUNCT. INGEST:ACRODYNIA KNOWN AS"PINK DISEASE"
OCCURS IN INDIVIDUALS SENSITIVE TO MERCURY W/BLUISH-(ING 11)
RTECS #:9999999ZZ

Ingrid Name:ING 10:PINK COLOR OF HANDS & FEET, APATHY, ANOREXIA, FLUSH,
FEVER, NEPHROTIC SYNDROME W/ALBUMINURIA & GENERALIZED(ING 12)
RTECS #:9999999ZZ

Ingrid Name:ING 11:EDEMA, DIAPHORESIS, PHOTOPHOBIA, INSOMNIA & MOST
CHARACT, PRURITIC & SOMETIMES PAINFUL SCALING & PEELING (ING 13)
RTECS #:9999999ZZ

Ingrid Name:ING 12:OF SKIN OF HANDS & FEET W/BULLOUS LESIONS. MERCURY
CMPDS APPEARS ON NAVY LISTING OF OCCUP REPRO HAZ. (ING 14)
RTECS #:9999999ZZ

Ingrid Name:ING 13:SEEK CONSULTATION FROM APPROP HLTH PROF CONCERNING
LATEST HAZ LIST INFO & SAFE HNDLG & EXPOS RECOMM .
RTECS #:9999999ZZ

Ingrid Name:FIRST AID PROC:OF CHEM REMAINS (APPROX 15-20 MIN). GET MD
IMMED. INGEST:REMOVE INGESTED POISON BY GASTRIC (ING 16)
RTECS #:9999999ZZ

Ingrid Name:ING 15:LAVAGE W/TAP WATER/BY EMESIS & CATHARSIS. MAINTAIN
BLOOD PRESS, AIRWAY & GIVE O*2 IF RESP DEPRESSED. GET (ING 17)
RTECS #:9999999ZZ

Ingrid Name:ING 16:MD IMMED. ADMIN OF GASTRIC LAVAGE/O*2 SHOULD BE BY
QUALIFIED MED PERS. ANTIDOTE:GIVE DIMERCAPROL, 3MG/KG (ING 18)
RTECS #:9999999ZZ

Ingrid Name:ING 17:(0.3 ML/10KG) EVERY 4 HRS FOR FIRST 2 DAYS & THEN 2
MG/KG EVERY 12 HRS FOR TOTAL OF 10 DAYS IF NEC. (ING 19)
RTECS #:9999999ZZ

Ingrid Name:ING 18:DIMERCAPROL IS AVAIL AS 10% SOLN IN OIL FOR
INTRAMUSC ADMIN. HEMODIALYSIS WILL SPEED REMOVAL OF MERCURY- (ING
20)
RTECS #:9999999ZZ

Ingrid Name:MERCURY (I) CHLORIDE; (MERCUROUS CHLORIDE). (PEL/TLV AS HG)

CAS:7546-30-7
RTECS #:OV8750000
Fraction by Wt: 100%
OSHA PEL:0.1 MG/M3, C, S
ACGIH TLV:0.05 MG/M3, S

Ingred Name:SUPP DATA:CONVERTED TO MERCURIC ION LEADING TO ACUTE
MERCURIALISM W/BURNING OF MOUTH & THROAT,THIRST/NAUSEA/VOM, (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:SEVERE GI IRRIT, BLOODY DIARRHEA, SHOCK, CARDIAC
ARRHYTHMIAS, PERIPHERAL VASCULAR COLLAPSE & SLOW BRTHG. (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:CHRONIC:INHAL:RESP SYSTEM EFTS W/LOSS OF SMELL,
RHINITIS, COUGH & FEVER. CHRONIC MERCURIALISM MAY OCCUR W/3(ING 5)
RTECS #:9999999ZZ

=====
===== Hazards Identification =====

LD50 LC50 Mixture:LD50:(ORAL,RAT)166 MG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:NEUROTOXIN, NEPHROTOXIN & EYE, MUC
MEMB & SKIN IRRITANT. ACUTE:INHAL:MAY CAUSE IRRIT OF RESP TRACT
W/COUGHING, PAIN & TIGHTNESS IN CHEST & DFCLTY BRTHG. VAP MAY CAUSE
DYS/PNEA, COUGH, FEVER, SALIVATION & METALLIC TASTE, NECROTIZING
BRONCHIOLITIS, PNEUMONITIS, PULM EDEMA & PNEUMOTHORAX. ACIDOSIS &
RENAL (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:DAMAGE W/RENAL FAILURE MAY OCCUR. MAY
CROSS PLACENTAL BARRIER TO BECOME HAZ TO FETUS. MERCURY IS EXCRETED
IN HUMAN MILK. SKIN:MAY CAUSE IRRIT. ABSORP MAY LEAD TO SYMPS AS
DETAILED IN ACUTE IN HAL. EYE:MAY CAUSE SLIGHT TRANSIENT REDNESS &
SWELLING BUT IN EXCEPTIONAL CASES INDUCED INFLAMMATION & (SUPP
DATA)
Medical Cond Aggravated by Exposure:PERSONS W/HISTORY OF SKIN, NERVOUS
SYSTEM, KIDNEY OR CHRONIC RESPIRATORY DISEASE MAY BE AT AN
INCREASED RISK FROM EXPOSURE.

=====
===== First Aid Measures =====

First Aid:INHAL:REMOVE TO FRESH AIR IMMED. IF BRTHG STOPPED, GIVE ARTF
RESP. KEEP WARM & AT REST. TREAT SYMPTOMATICALLY & SUPPORTIVELY.
GET MD IMMED. SKIN:REMOVE CONTAMD CLTHG & SHOES IMMED. WASH
AFFECTED AREA W/SOAP/MILD DETERGENT & LG AMTS OF WATER UNTIL NO
EVID OF CHEM REMAINS (APPROX 15-20 MIN). GET MD IMMED. EYE:WASH
IMMED W/LG AMTS OF WATER/NORM SALINE, OCCSNLY LIFTING LIDS UNTIL NO
EVID (ING 15)

=====
===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR
REGULAR FOAM. LG FIRES:USE WATER SPRAY, FOG OR REGULAR FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP.
MOVE CNTNR FROM FIRE AREA IF W/OUT RISK. USE AGENTS SUITABLE FOR
TYPE OF SURROUNDING FIRE. USE (SUPP DATA)

Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures:DO NOT TOUCH SPILLED MATL. STOP LEAK IF W/OUT RISK. SML:TAKE UP W/SAND/OTHER ABSORB & PLACE INTO CNTNRS FOR LATER DISP. SML DRY:W/CLEAN SHOVEL PLACE MATL INTO CLEAN, DRY CNTNR & COVER. MOVE CNTNRS FRO M SPILL AREA. LG:DIKE FAR AHEAD OF SPILL (ING 24)

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE SUBSTANCES. OBSERVE ALL FED, STATE & LOCAL REGS WHEN STORING SUBSTANCE. FOR ASSISTANCE, CNTCT DISTRICT DIRECTOR OF EPA.

Other Precautions:MAY BURN BUT DOES NOT IGNITE READILY. PREVENT DISPERSION OF DUST IN AIR. DO NOT ALLOW SPILLED MATL TO CONTAM WATER SOURCES.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAM LEVELS FOUND IN WORK PLACE, MUST NOT EXCEED WORKING LIM OF RESPIRATOR & BE NIOSH/MSHA APPRVD. FOR MORE SPECIFIC INFORMATION, CONTACT NEHC .

Ventilation:PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:CHEMICAL WORKERS GOGGLES .

Other Protective Equipment:APPROPRIATE (IMPERVIOUS) CLOTHING & EQUIPMENT. EYE WASH FOUNTAIN W/IN IMMEDIATE WORK AREA.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

FIRE FIGHT PROC:WATER IN FLOODING AMTS AS FOG. AVOID BRTHG POISONOUS VAPS/DUSTS. EFTS OF OVEREXP:SCARRING OF CONJUNCTIVA. INGEST:MAY CAUSE AN IRRITANT CATHARTIC/PURGATIVE EFT. IF RETAINED, 30-40 MG/KG MAY BE FATAL. POORLY ABSORBED FROM GI TRACT. ON CNTCT W/ALKALINE DIGESTIVE JUICES IT MAY BE (ING 2)

===== Physical/Chemical Properties =====

HCC:N1

Melt/Freeze Pt:M.P/F.P Text:732F,389C

Spec Gravity:7.15

Solubility in Water:INSOLUBLE

Appearance and Odor:ODORLESS/TASTELESS/WHITE CRYSTALS/CRYSTALLINE PWDR WHICH DARKENS ON EXPOS TO LT

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

POTASSIUM, SODIUM. FOR A COMPLETE LISTING OF MATERIALS OT AVOID, CONTACT NEHC .

Stability Condition to Avoid:DECOMPOSES UPON EXPOSURE TO SUNLIGHT TO MERCURIC CHLORIDE & METALLIC MERCURY.

Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS MAY
INCLUDE TOXIC FUMES OF CHLORIDES & MERCURY.

===== Disposal Considerations =====

Waste Disposal Methods:MATERIALS WHICH CONTAIN THIS SUBSTANCE AT/ABOVE
REGULATORY LEVEL OF 0.2MG/L MEET EPA CHARACTERISTIC OF TOXICITY &
MUST BE DISPOSED OF I/A/W 40 CFR PART 262. EPA HAZARDOUS WASTE
NUMBER D009. DISPOSE OF I/A/W FEDERAL, STATE & LOCAL REGULATIONS .

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assume responsibility for the suitability of this information to their
particular situation.

J.T.BAKER CHEMICAL CO -- MERCUROUS NITRATE, MONOHYDRATE -- 6810-00-241-1095

=====
Product Identification
=====

Product ID:MERCUROUS NITRATE, MONOHYDRATE
MSDS Date:10/11/1985
FSC:6810
NIIN:00-241-1095
MSDS Number: BJDZC
=== Responsible Party ===
Company Name:J.T.BAKER CHEMICAL CO
Address:222 RED SCHOOL LANE
City:PHILLIPSBURG
State:NJ
ZIP:08865
Country:US
Info Phone Num:201-859-2151
Emergency Phone Num:201-859-2151/800-424-9300 (CHEMTREC)
CAGE:DO870

==== Contractor Identification ====

Company Name:J.T.BAKER CHEMICAL CO.
Address:222 RED SCHOOL LANE
City:PHILLIPSBURG
State:NJ
ZIP:08865-2219
Country:US
Phone:201-859-2151
CAGE:DO870
Company Name:MALLINCKRODT BAKER, INC.
Address:222 RED SCHOOL LANE
Box:City:PHILLIPSBURG
State:NJ
ZIP:08865
Country:US
Phone:800-582-2537
CAGE:70829

=====
Composition/Information on Ingredients
=====

Ingred Name:MERCUROUS NITRATE, MONOHYDRATE
CAS:7782-86-7
Other REC Limits:NONE SPECIFIED
OSHA PEL:0.1 MG/M3 (HG)
ACGIH TLV:.05 MG (HG) /M3 (VAPOR)
EPA Rpt Qty:10 LBS
DOT Rpt Qty:10 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL RAT) IS 170 MG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE-EYES:IRRITATION.
SKIN:IRRITATION. INHALATION:DIFFICULT BREATHING AND CENTRAL NERVOUS
SYSTEM DISORDERS. INGESTION:LOCAL TISSUE DAMAGE AND CNS DISORDERS.
CHRONIC-EYES:IRRITATION. SKIN:IRRITATION. INHALATION:BUILD-UP OF

METAL IN THE BRAIN,LIVER,AND KIDNEYS. INGESTION:BUILD-UP OF METAL
IN THE BRAIN,LIVER, AND KIDNEYS
Explanation of Carcinogenicity:NONE OF THE COMPOUNDS IN THIS PRODUCT IS
LISTED BY IARC, NTP, OR OSHA AS A CARCINOGEN.
Effects of Overexposure:EYES:IRRITATION. SKIN:IRRITATION.
INHALATION:HEADACHE, COUGHING, DIZZINESS, OR DIFFICULT BREATHING.
INGESTION:NAUSEA, DIZZINESS, AND TISSUE DAMAGE.
Medical Cond Aggravated by Exposure:PRE-EXISTING SKIN, EYE AND LUNG
CONDITIONS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

=====
===== First Aid Measures =====

First Aid:EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN. SKIN:WASH WITH
SOAP & WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDRER BEFORE
REUSE. INHALED:REMOVE TO FRESH AIR. RESTORE BREATHING IF
NECESSARY. INGESTED:IMMEDIATELY INDUCE VOMITING AND GET IMMEDIATE
MEDICAL CARE. GIVE NOTHING BY MOUTH IF UNCONSCIOUS. *IF IRRITATION
PERSISTS OR IS SEVERE,SEE A DOCTOR.*

=====
===== Fire Fighting Measures =====

Extinguishing Media:USE WATER SPRAY.
Fire Fighting Procedures:FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA &
FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER
SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire/Explosion Hazard:FIRE OR EXCESSIVE HEAT MAY CAUSE
PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS(NITROGEN OXIDES).

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS AND
FULL PROTECTIVE CLOTHING. KEEP COMBUSTIBLES AWAY FROM SPILLED
MATERIAL. WITH A CLEAN SHOVEL, CAREFULLY PLACE MATERIAL INTO A
CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH SPILL WITH
WATER.
Neutralizing Agent:NONE

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY, WELL VENTILATED
AREA. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. PROTECT
CONTAINERS FROM PHYSICAL DAMAGE.
Other Precautions:STORE SEPARATELY AND AWAY FROM FLAMMABLE AND
COMBUSTIBLE MATERIALS. THIS MATERIAL MAY IGNITE OTHER COMBUSTIBLE
MATERIALS. KEEP CONTAINERS AWAY FROM SUN AND AWAY FROM HEAT.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:RESPIRATOR WILL NOT NORMALLY BE NECESSARY. USE
NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR OR RESPIRATOR FOR
DUST/MIST IF EXPOSURE IS ABOVE THE TLV/PEL. SEE 29 CFR 1910.134 FOR
REGULATIONS PERTAINING TO RESPIRATOR USE.
Ventilation:GENERAL ROOM VENTILATION IS NORMALLY ADEQUATE. USE LOCAL
EXHAUST IF NECESSARY TO CONTROL EXPOSURE BELOW PEL/TLV.
Protective Gloves:NEOPRENE, NITRILE, VPC OR NATURAL RUBBER
Eye Protection:SAFETY GLASSES OR GOGGLES
Other Protective Equipment:EYE WASH STATION AND SAFETY SHOWER.

INDUSTRIAL-TYPE WORK CLOTHING AND APRON AS REQUIRED.
Work Hygienic Practices:USE GOOD CHEMICAL HYGIENE PRACTICE. AVOID
UNNECESSARY CONTACT.
Supplemental Safety and Health
MATERIAL IS A STRONG OXIDIZER. CONTACT MAY CAUSE BURNS TO SKIN AND
EYES.

===== Physical/Chemical Properties =====

HCC:T4
Vapor Density:1.90
Spec Gravity:4.78
Solubility in Water:COMPLETE
Appearance and Odor:SMALL, COLORLESS CRYSTALS WITH NO ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
MOST COMMON METALS, COMBUSTIBLE MATERIALS, STRONG REDUCING AGENTS.
Stability Condition to Avoid:HIGH TEMPERATURES AND OPEN FLAMES.
Hazardous Decomposition Products:NITROGEN OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE I/A/W ALL FEDERAL, STATE AND LOCAL
REGULATIONS.

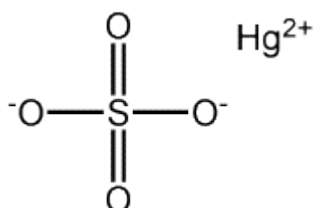
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assume responsibility for the suitability of this information to their
particular situation.

Mercuric sulfate

- Mercury bisulfate
- Mercury(II) sulfate

Formula HgSO₄

Structure



Description Odorless white granules or crystalline powder.

Uses

Electrolyte for primary batteries, with sodium chloride for extracting gold and silver from roasted pyrites, as reagent for wine coloring, barbital, and cysteine.

Registry Numbers and Inventories.

CAS	7783-35-9
NIH PubChem CID	24544
EC (EINECS/ELINCS)	231-992-5
EC Index Number	080-002-00-6
EC Class	T+; R26/27/28, R33, N; R50-53
RTECS	OX0500000
RTECS class	Other
UN (DOT)	1645
Merck	13,5914

Beilstein/Gmelin	32386 (G)
RCRA	D009
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	HgO ₄ S
Formula mass	296.65
Melting point, °C	850
Vapor pressure, mm_{Hg}	0.0012
Vapor density (air=1)	17.
Odor threshold	Odorless.
Density	5.995 g/cm ³ (21 C)
Solubility in water	Decomposes
Heat of fusion	6.0 kJ/mol

Hazards and Protection.

Storage	Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Poison room locked.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Store protected from light.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.
Disposal code	20
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Substance decomposes when exposed to water, violently reacts with hydrogen chloride, and is corrosive to many metals (including aluminum, copper, iron, magnesium, lead, and zinc).
Decomposition	Oxides of sulfur, mercury/mercury oxides.

Fire.

Autoignition, °C	> 450
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes. Extinguishing media: Use foam, dry chemical, or carbon dioxide. Use agent most appropriate to extinguish fire.

Fire potential Nonflammable.

Combustion products None

[NFPA](#) Health 2

Flammability 0

Reactivity 0

Health.

Exposure limit(s) NIOSH REL: C 0.1 mg/m³ [skin] OSHA PEL: C 0.1 mg/m³ 10 mg/m³ (as Hg)

Poison_Class 2 (Very strong toxins)

Exposure effects Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause anemia and other blood cell abnormalities. Repeated exposure may cause central nervous system damage.

Ingestion Harmful if swallowed. May cause kidney damage. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract. May cause adverse nervous system effects and possible

Inhalation May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. May cause effects similar to those described for ingestion.

Skin May be absorbed through the skin. May cause severe irritation and possible burns.

Eyes Contact may cause severe eye irritation and possible eye damage.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation	Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Skin	Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number	1645
Response guide	151
Hazard class	6.1
Packing Group	II
USCG CHRIS Code	MRS
HS Code	2833 29 70
Std. Transport #	4923257



Material Safety Data Sheet

Mercury(II) chloride

ACC# 13800

Section 1 - Chemical Product and Company Identification

MSDS Name: Mercury(II) chloride

Catalog Numbers: S80074, M155I-100, M155I-3, M155I-50, M155I-500, M156I-100, M156I-50, M156I-500

Synonyms: Calochlor; Corrosive mercury chloride; Corrosive sublimate; Mercury bichloride; Mercury perchloride; Mercury(II) chloride; Mercuric chloride.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7487-94-7	Mercury(II) chloride	>99.5	231-299-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! May be fatal if swallowed. May be fatal if absorbed through the skin. Causes severe eye and skin irritation with possible burns. Causes digestive and respiratory tract irritation with possible burns. May impair fertility. May cause harm to the unborn child. Harmful if inhaled. May cause allergic skin reaction. May cause kidney damage. May cause central nervous system effects. Light sensitive. Severe marine pollutant.

Target Organs: Kidneys, central nervous system, reproductive system.

Potential Health Effects

Eye: Exposure to mercury or mercury compounds can cause discoloration on the front

surface of the lens, which does not interfere with vision. Causes severe eye irritation and possible burns. Contact with mercury or mercury compounds can cause ulceration of the conjunctiva and cornea.

Skin: May be fatal if absorbed through the skin. Causes severe skin irritation and possible burns. May cause allergic contact dermatitis.

Ingestion: May be fatal if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Causes gastrointestinal tract burns. May cause muscle tremor and impaired motor function. May cause cardiac disturbances. Symptoms of acute mercury salt poisoning include nausea, vomiting, bloody diarrhea, foul taste, loosened teeth, circulatory collapse, peripheral neurological disease, and kidney damage requiring dialysis.

Inhalation: May cause central nervous system effects including vertigo, anxiety, depression, muscle incoordination, and emotional instability. May cause gastrointestinal effects including gum and mouth inflammation, jaw necrosis, and loosening of the teeth. May cause burns to the respiratory tract. Acute exposure to high concentrations of mercury vapors may cause severe respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause reproductive and fetal effects. Chronic ingestion may cause accumulation of mercury in body tissues. Laboratory experiments have resulted in mutagenic effects. May be rapidly transferred across the placenta and cause adverse fetal effects. Chronic mercury poisoning involves kidney damage, visual defects, tremor, and severe psychological changes. The brain is the critical organ for chronic mercury poisoning. The half-life of mercury in the brain is 10 years. Cumulative toxicity is a major consideration with chronic

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: POISON material. If swallowed, get medical aid immediately. Only induce vomiting if directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: The concentration of mercury in whole blood is a reasonable measure of the body-burden of mercury and thus is used for monitoring purposes. Persons with kidney disease, chronic respiratory disease, liver disease, or skin disease may be at increased risk from exposure to this substance.

Antidote: The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel. The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Use water fog, dry chemical, carbon dioxide or alcohol type foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 4; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Store protected from light. Use only with adequate ventilation. Extreme care should always be taken to prevent skin and gastrointestinal absorption because these routes of entry can greatly increase the total body burden and are often overlooked in occupational settings.

Storage: Store in a tightly closed container. Keep away from food and drinking water. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation

to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Mercury(II) chloride	0.025 mg/m ³ TWA (as Hg) (listed under Mercury inorganic compounds). Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Mercury inorganic compounds).	0.05 mg/m ³ TWA (vapor, except organoalkyls, as Hg) (listed under Mercury compounds). 10 mg/m ³ IDLH (as Hg, except organo(alkyl) compounds) (listed under Mercury compounds).	none listed

OSHA Vacated PELs: Mercury(II) chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 4.7

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.

Boiling Point: 300 deg C

Freezing/Melting Point: 277 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 5.44 at 25°C

Molecular Formula: HgCl₂

Molecular Weight: 271.50

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Light, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, ammonia, copper, iron, silver salts, potassium, antimony, sodium, lead, hypophosphites, formates, sulfites, phosphates, albumin, gelatin, alkalies, alkaloid salts, lime water, arsenic, bromides, borax, carbonates, reduced iron, infusions of cinchona, columbo, oak bark or senna, tannic acid, metallic halides, vegetable astringents.

Hazardous Decomposition Products: Mercury/mercury oxides, chloride fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7487-94-7: OV9100000

LD50/LC50:

CAS# 7487-94-7:

Draize test, rabbit, eye: 50 ug/24H Severe;

Draize test, rabbit, skin: 500 mg/24H Severe;

Oral, mouse: LD50 = 6 mg/kg;

Oral, rat: LD50 = 1 mg/kg;

Skin, rat: LD50 = 41 mg/kg;

Carcinogenicity:

CAS# 7487-94-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: See entry in the Documentation of the Threshold Limit Values and Biological Exposure Indices issued by ACGIH.

Teratogenicity: Mercuric chloride has been embryotoxic, fetotoxic, and teratogenic in experimental animals, and has affected fertility in male mice. Inorganic mercury has been implicated in male impotence, menstrual disorders, and spontaneous abortions in humans.

Reproductive Effects: Data clearly indicate that mercury can affect both male & female reproductive outcomes. It has not been possible to unequivocally determine a safe exposure level for protection of reproduction function in either male or female workers, particularly since many studies didn't adequately evaluate dermal exposure. Those planning to have children should keep their exposure to mercury as low as possible by engineering controls, personal protective equipment for skin & respiratory tract, & good personal hygiene

Mutagenicity: Micronucleus Test: Human, Lymphocyte = 5 umol/L.; Mutation Test Systems - not otherwise specified: Human, Lymphocyte = 2 umol/L.; Cytogenetic Analysis: Human, HeLa cell = 10 mg/L.; Cytogenetic Analysis: Human, Lymphocyte = 2 umol/L.

Neurotoxicity: Refer to Patty's Industrial Hygiene and Toxicology for specific nervous system abnormalities.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.903 mg/L; 24 Hr; Unspecified Fish: Fathead Minnow: LC50 = 0.037 mg/L; 48 Hr; Unspecified Fish: Bluegill/Sunfish: LC50 = 0.16 mg/L; 96 Hr; Static at 13.5-16.2°C (pH 7.1-7.3) Water flea Daphnia: LC50 = 0.093 mg/L; 48 Hr; Unspecified No data available.

Environmental: Mercury can be accumulated from water by many organisms (up to 10,000 fold).

Physical: Compound decomposes to metallic mercury when in contact with organic matter and sunlight.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	MERCURIC CHLORIDE	MERCURIC CHLORIDE
Hazard Class:	6.1	6.1
UN Number:	UN1624	UN1624
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7487-94-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

CAS# 7487-94-7: 500 lb lower threshold TPO; 10000 lb upper threshold TPO

SARA Codes

CAS # 7487-94-7: immediate, delayed.

Section 313

This material contains Mercury(II) chloride (listed as Mercury compounds), >99.5%, (CAS# 7487-94-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7487-94-7 (listed as Mercury compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7487-94-7 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7487-94-7 can be found on the following state right to know lists: California, (listed as Mercury compounds), New Jersey, Pennsylvania, Massachusetts.

California Prop 65

WARNING: This product contains Mercury(II) chloride, listed as 'Mercury compounds', a chemical known to the state of California to cause developmental reproductive toxicity. California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T+ C N

Risk Phrases:

R 28 Very toxic if swallowed.

R 34 Causes burns.

R 48/24/25 Toxic : danger of serious damage to health by prolonged exposure in contact with skin and if swallowed.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 7487-94-7: 3

Canada - DSL/NDSL

CAS# 7487-94-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E, D1A, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7487-94-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Methyl Red, indicator, p.a.

ACC# 96266

Section 1 - Chemical Product and Company Identification

MSDS Name: Methyl Red, indicator, p.a.

Catalog Numbers: AC264440000, AC264440250, AC264441000, AC9500851

Synonyms: C.I. Acid Red 2; 2-(4-Dimethylaminophenylazo)benzoic acid; C.I. 13020; p-(Dimethylamino)azobenzene-o-carboxylic acid; Methyl Red.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
493-52-7	Methyl Red	100	207-776-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark red to purple solid.

Caution! May cause eye and skin irritation. May cause respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: Contact may cause transient eye irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Chronic exposure may cause liver damage.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion

and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methyl Red	none listed	none listed	none listed

OSHA Vacated PELs: Methyl Red: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: dark red to purple

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 178-182 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble in water.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₅H₁₅N₃O₂

Molecular Weight: 269.30

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Materials containing similar functional groups can decompose at elevated temperatures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 493-52-7: DG8960000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 493-52-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 493-52-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 493-52-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 493-52-7: 2

Canada - DSL/NDSL

CAS# 493-52-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Methyl Green

ACC# 60340

Section 1 - Chemical Product and Company Identification

MSDS Name: Methyl Green

Catalog Numbers: M295-25

Synonyms: C.I. Green; CI 42585

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7114-03-6	Methyl Green	ca. 100	230-415-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this

substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methyl Green	none listed	none listed	none listed

OSHA Vacated PELs: Methyl Green: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 233 deg C

Decomposition Temperature: > 233 deg C

Solubility: Moderately soluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: C₂₇H₃₅N₃.BrCl
Molecular Weight: 401.2651

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7114-03-6 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7114-03-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7114-03-6 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

This material contains Methyl Green (listed as Zinc compounds), ca. 100%, (CAS# 7114-03-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7114-03-6 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7114-03-6 can be found on the following state right to know lists: California, (listed as Zinc compounds), New Jersey, (listed as Zinc compounds), Pennsylvania, (listed as Zinc compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 7114-03-6: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7114-03-6 is not listed on the Canadian Ingredient Disclosure List.

EMS CATALOG NO: 18850
EMS PRODUCT: Methyl Violet 2B,
DATE: 07/09/96
PAGE NUMBER: One of 4

MATERIAL SAFETY DATA SHEET

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Electron Microscopy Sciences assumes no responsibility for personal injury or property damage to vendees, users or third parties caused by the material. Such vendees or users assume all risks associated with the use of the material.

ELECTRON MICROSCOPY SCIENCES
321 MORRIS ROAD
P.O. BOX 251
FORT WASHINGTON, PA 19034 24 HOUR EMERGENCY PHONE NUMBER
(215) 646-1566 CHEMTREC: (800) 424-9300

FOR PRODUCT AND SALES INFORMATION

CONTACT ELECTRON MICROSCOPY SCIENCES OFFICE ABOVE.

PRODUCT IDENTIFICATION

PRODUCT NAME: Methyl Violet 2B

FORMULA: C₂₄H₂₇N₃.HCL

FORMULA WT.: 393.97

CAS #: 08004-87-3

NIOSH/RTECS NO.: GC8425000

COMMON SYNONYMS: C.I. Basic Violet; Methyl Violet

PRECAUTIONARY LABELLING

SAFETY CODE SYSTEM: 2 = Moderate 1 = Slight

Health = 2 Flammability = 1 Reactivity = 1 Contact = 2

LABORATORY PROTECTIVE EQUIPMENT:

Safety glasses, lab coat, vent hood and proper gloves

PRECAUTIONARY LABEL STATEMENTS:

WARNING!

HARMFUL IF SWALLOWED CAUSES IRRITATION
CAUSES IRRITATION

Avoid contact with eyes, skin, clothing. Keep in tightly closed container.
Wash thoroughly after handling.

HAZARDOUS COMPONENTS

% CAS NO.

Methyl Violet 2B
90-100 08004-87-3

PHYSICAL DATA

BOILING POINT: N/A MELTING POINT: N/A
VAPOR PRESSURE (mmHg): N/A VAPOR DENSITY(air=1): N/A
SPECIFIC GRAVITY(H2O=1): N/A EVAPORATION RATE
(Butyl Acetate=1): N/A
SOLUBILITY(H2O): Moderate (1 to 10 %)
APPEARANCE & ODOR: Green crystals

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A

FIRE EXTINGUISHING MEDIA:

Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES:

Firefighters should wear proper protective equipment and self-contained
breathing apparatus with full facepiece operated
in positive pressure mode.

TOXIC GASES PRODUCED: Hydrogen chloride, nitrogen oxides

HEALTH HAZARD DATA

TOXICITY: LD50 (oral-mouse) (mg/kg) - 105
LD50 (ipr-mouse) (mg/kg) - 6

EFFECTS OF OVEREXPOSURE: No effects of overexposure were documented.

EMERGENCY AND FIRST-AID PROCEDURES:

CALL A PHYSICIAN.

If swallowed, if conscious, immediately induce vomiting.

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Flush skin with water.

REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong oxidizing agents

DECOMPOSITION PRODUCTS: Hydrogen chloride, oxides of nitrogen

SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE:

Wear self-contained breathing apparatus and full protective clothing. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURES:

Dispose in accordance with all applicable Federal, State, and local environmental regulations.

INDUSTRIAL PROTECTIVE EQUIPMENT

VENTILATION: Use adequate general or local exhaust ventilation to keep fume or dust levels as low as possible.

RESPIRATORY PROTECTION:

None required where adequate ventilation conditions exist. If airborne concentration is high, use an appropriate respirator or dust mask.

EYE/SKIN PROTECTION: Safety glasses with sideshields, uniform, rubber gloves are recommended.

STORAGE AND HANDLING PRECAUTIONS

STORAGE COLOR CODE: Orange

SPECIAL PRECAUTIONS: Keep tightly closed. Suitable for any general chemical storage area.

TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

Proper Shipping Name Chemicals, n.o.s.

INTERNATIONAL (I.M.O.)

Proper shipping Name Chemicals, n.o.s.

N/A = Not Applicable or Not Available

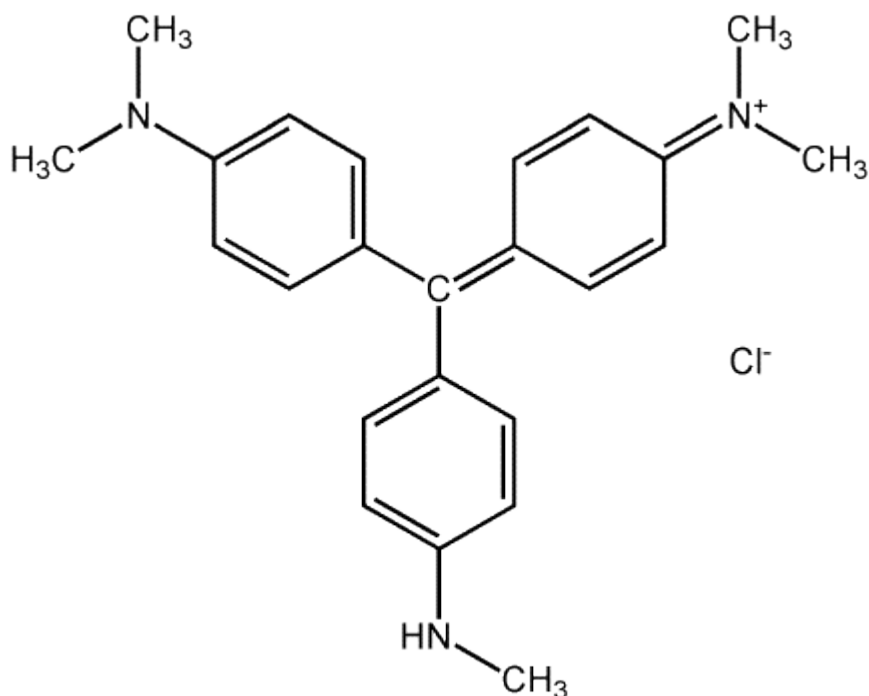
Methyl Violet

- C.I. Basic Violet 1
- [4-[(4-Dimethylaminophenyl)-(4-methylaminophenyl)methylidene]-1-cyclohexa-2,5-dienylidene]-dimethyl-azanium

Formula

C₂₄H₂₈ClN₃

Structure



Description

Green crystalline powder.

Uses

Ph indicator, stain.

Registry Numbers and Inventories.

CAS

8004-87-3

NIH PubChem CID

2724053

EC (EINECS/ELINCS)

616-846-4

EC Class

Xn; Carc; Xi; N, R: 22-40-41-50/53, S: 22-26-36/37/39-61

RTECS	BO9000000
RTECS class	Agricultural Chemical and Pesticide; Mutagen
UN (DOT)	3077
Beilstein/Gmelin	2757825
EPA OPP	39503
Swiss Giftliste 1	G-5422
Canada DSL/NDSL	DSL
US TSCA	Listed
Austrailia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	C ₂₄ H ₂₈ ClN ₃
Formula mass	393.96
Melting point, °C	137
Solubility in water	30 g/L (25 C)

Hazards and Protection.

Storage	Store in a cool, dry place. Keep containers tightly closed.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizers.
Decomposition	Hydrogen chloride, nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible. Extinguishing media: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material. Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
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Flammability 0

Reactivity 0

Health.

Poison_Class 2

Exposure effects Prolonged or repeated skin contact may cause dermatitis.

Ingestion Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation Dust is irritating to the respiratory tract.

Skin May cause skin irritation.

Eyes This product contains a cationic dye. Similar dyes have caused permanent injury to the cornea and conjunctiva in documented exposure cases with human or rabbit eyes.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Skin Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number 3077

Response guide [171](#)

HS Code 3204 13 00

Material Safety Data Sheet

Methyl Yellow, indicator grade

ACC# 25294

Section 1 - Chemical Product and Company Identification

MSDS Name: Methyl Yellow, indicator grade

Catalog Numbers: AC151400000, AC151400250, AC151401000

Synonyms: C.I. 11020; 4-Dimethylaminoazobenzene; N,N-Dimethyl-4-phenylazoaniline; Solvent Yellow 2.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-11-7	Methyl Yellow	100	200-455-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange powder.

Danger! Toxic if swallowed. Possible cancer hazard. May cause cancer based on animal data. Possible risks of irreversible effects. May cause methemoglobinemia. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

Target Organs: Blood, kidneys, liver, lungs, respiratory system, skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause dermatitis. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May form methemoglobin which in sufficient concentration causes cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). Toxic if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged or

repeated skin contact may cause dermatitis. May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. Chronic exposure may cause liver damage. Chronic exposure may cause blood effects. Possible risk of irreversible effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: POISON material. If swallowed, get medical aid immediately. Only induce vomiting if directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methyl Yellow	none listed	none listed	(Cancer suspect agent - see 29 CFR 1910.1003)

OSHA Vacated PELs: Methyl Yellow: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: orange-brown - orange

Odor: slight characteristic odor

pH: 5 - 7 (10g/L aq. sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 111 - 117 deg C

Decomposition Temperature:Not available.

Solubility: 13.6 mg/L

Specific Gravity/Density:Not available.

Molecular Formula:C14H15N3

Molecular Weight:225.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Acids, acid anhydrides.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 60-11-7: BX7350000

LD50/LC50:

CAS# 60-11-7:

Oral, mouse: LD50 = 300 mg/kg;

Oral, rat: LD50 = 200 mg/kg;

Carcinogenicity:

CAS# 60-11-7:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 1/1/88
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

Epidemiology: Tumorigenic effects have been reported in experimental animals.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 60-11-7: waste number U093.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DYES, SOLID, TOXIC, N.O.S.	DYE SOLID TOXIC NOS (METHYL YELLOW)
Hazard Class:	6.1	6.1
UN Number:	UN3143	UN3143
Packing Group:	III	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-11-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 60-11-7: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Methyl Yellow (CAS# 60-11-7, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 60-11-7 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-11-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Methyl Yellow, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 60-11-7: 0.2 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 25 Toxic if swallowed.

R 40 Limited evidence of a carcinogenic effect.

R 68 Possible risk of irreversible effects.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 60-11-7: No information available.

Canada - DSL/NDSL

CAS# 60-11-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 60-11-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Methylthymol blue, 96% (uv-vis)

ACC# 05614

Section 1 - Chemical Product and Company Identification

MSDS Name: Methylthymol blue, 96% (uv-vis)

Catalog Numbers: AC414940000, AC414940010, AC414940050, AC414940100, EK1196609, EK1196617, EK1196625

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
4310-80-9	Methylthymol blue	96.0	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark brown crystalline powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this

substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methylthymol blue	none listed	none listed	none listed

OSHA Vacated PELs: Methylthymol blue: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: dark brown

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula:C37H39N2Na5O13S

Molecular Weight:866.73

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Strong oxidants.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 4310-80-9 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 4310-80-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 4310-80-9 is not listed on the TSCA inventory. It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the

CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 4310-80-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 4310-80-9: No information available.

Canada - DSL/NDSL

CAS# 4310-80-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

MIREX CORP DBA REXCO DISTRIBUTING INC -- ECO-C-1140 REXCO POWERSAFE
NEUTRAL FLOOR CLEANER -- 7930-00F037454

=====
Product Identification
=====

Product ID:ECO-C-1140 REXCO POWERSAFE NEUTRAL FLOOR CLEANER
MSDS Date:09/18/1991
FSC:7930
NIIN:00F037454
MSDS Number: BWJCM
=== Responsible Party ===
Company Name:MIREX CORP DBA REXCO DISTRIBUTING INC
Address:2336 KEYSTONE DR
City:OMAHA
State:NE
ZIP:68134-5000
Country:US
Info Phone Num:402-390-0879
Emergency Phone Num:402-390-0879
CAGE:0ZUJ3

=====
Contractor Identification
=====

Company Name:MIREX CORP DBA REXCO DISTRIBUTING INC
Address:2336 KEYSTONE DR
Box:City:OMAHA
State:NE
ZIP:68134-5000
Country:US
Phone:402-390-0879
CAGE:0ZUJ3

=====
Composition/Information on Ingredients
=====

Ingred Name:NON HAZARDOUS INGREDIENTS

=====
Hazards Identification
=====

Routes of Entry: Inhalation:NO Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:SKIN/EYES: PROLONGED/REPEATED CONTACT
OF PRODUCT MAY CAUSE IRRITATION. INGESTION: MUCOUSAL IRRITATION.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION, REDDENING, NAUSEA, VOMITING,
DIARRHEA
Medical Cond Aggravated by Exposure:EXISTING DERMATITIS.

=====
First Aid Measures
=====

First Aid:EYES: FLUSH W/WATER FOR 15 MINS.SKIN: WASH W/PLENTY OF SOAP &
WATER. INGESTION: DRINK PLENTY OF WATER. DON'T INDUCE VOMITING.
OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Fire Fighting Measures
=====

Flash Point:NONE TO BOILING
Fire Fighting Procedures:WEAR SELF CONTAINED BREATHING APPRATUS W/FULL
PROTECTIVE EQUIPMENT.

===== Accidental Release Measures =====

Spill Release Procedures:STOP LEAK AT ONCE. PREVENT RUNOFF. MOP,
SHOVEL, PUMP/ABOSRB W/INERT MATERIAL & PLACE IN SOUND CONTAINERS.

===== Handling and Storage =====

Handling and Storage Precautions:NO SPECIAL REQUIREMENTS.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE REQUIRED UNDER NORMAL USE CONDITIONS.
Ventilation:NO SPECIAL REQUIREMENTS.
Protective Gloves:RUBBER/IMPERVIOUS
Eye Protection:CHEMICAL SPLASH GOGGLES
Other Protective Equipment:PROTECTIVE CLOTHING COVERING ARMS & LEGS.
Work Hygienic Practices:USE GOOD WORK & HYGIENIC PRACTICES.
Supplemental Safety and Health

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:212F
Spec Gravity:1.046
Solubility in Water:COMPLETE
Appearance and Odor:AQUA W/BUBBLEGUM FRAGRANCE.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
ACIDS, OXIDIZERS, MURIATIC ACID, BLEACH.
Hazardous Decomposition Products:CO, CO2

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE THROUGH LOCAL SEWER/SEPTIC SYSTEMS IN
ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.

Disclaimer (provided with this information by the compiling agencies):
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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Molybdenum(iv) sulfide, 98.5%

ACC# 84738

Section 1 - Chemical Product and Company Identification

MSDS Name: Molybdenum(iv) sulfide, 98.5%

Catalog Numbers: AC215780000, AC215780050, AC215781000, AC215785000

Synonyms: Molybdenum disulfide; DAG 325; Molykote; Mopol M; Mopol S

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1317-33-5	Molybdenum(IV) sulfide	98.5	215-263-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark gray powder.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: Dust is irritating to the respiratory tract. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid

contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Molybdenum(IV) sulfide	10 mg/m ³ TWA (inhalable fraction); 3 mg/m ³ TWA (respirable fraction) (listed under Molybdenum).	5000 mg/m ³ IDLH (listed under Molybdenum). 5000 mg/m ³ IDLH (as Mo) (listed under Molybdenum insoluble compounds).	15 mg/m ³ TWA (total dust) (listed under Molybdenum insoluble compounds).

OSHA Vacated PELs: Molybdenum(IV) sulfide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: dark gray

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 5.51

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 2375 deg C

Decomposition Temperature:Not available.
Solubility: Soluble in aqua regia and sulfuric acid
Specific Gravity/Density:Not available.
Molecular Formula:MoS₂
Molecular Weight:160.07

Section 10 - Stability and Reactivity

Chemical Stability: Stability unknown.
Conditions to Avoid: Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials: Strong oxidizing agents, hydrogen peroxides, potassium nitrate.
Hazardous Decomposition Products: Oxides of sulfur, hydrogen sulfide, oxides of molybdenum.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 1317-33-5: QA4697000
LD50/LC50:
CAS# 1317-33-5:
Inhalation, rat: LC50 = >2820 mg/m³/4H;

Carcinogenicity:
CAS# 1317-33-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1317-33-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1317-33-5 can be found on the following state right to know lists: California, (listed as Molybdenum), California, (listed as Molybdenum compounds, n.o.s.), New Jersey, (listed as Molybdenum), Pennsylvania, (listed as Molybdenum), Minnesota, (listed as Molybdenum), Minnesota, (listed as Molybdenum insoluble compounds), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

- S 22 Do not breathe dust.
- S 24/25 Avoid contact with skin and eyes.
- S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
- S 37 Wear suitable gloves.
- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 1317-33-5: 0

Canada - DSL/NDSL

CAS# 1317-33-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1317-33-5 (listed as Molybdenum) is listed on the Canadian Ingredient Disclosure List.

SIGMA CHEMICAL CO -- MOLYBDENUM TRIOXIDE, M0753 -- 6810-00N021653

=====
Product Identification
=====

Product ID:MOLYBDENUM TRIOXIDE, M0753
MSDS Date:10/31/1989
FSC:6810
NIIN:00N021653
MSDS Number: BLNTP
=== Responsible Party ===
Company Name:SIGMA CHEMICAL CO
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Info Phone Num:314-771-5765
Emergency Phone Num:800-325-8070
CAGE:21076
=== Contractor Identification ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
Composition/Information on Ingredients
=====

Ingred Name:MOLYBDENUM TRIOXIDE (SARA III)
CAS:1313-27-5
RTECS #:QA4725000
OSHA PEL:5 MG MO/M3
ACGIH TLV:5 MG MO/M3; 9192

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 125 MG/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:HARMFUL IF SWALLOWED, INHALED, OR
ABSORBED THROUGH SKIN. CAUSES EYE AND SKIN IRRITATION. MATERIAL IS
IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:EYES OR SKIN: FLUSH EYES OR SKIN WITH COPIOUS AMOUNTS OF
WATER FOR AT LEAST 15 MIN WHILE REMOVING CONTAMINATED CLOTHING AND
SHOES. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRAT ION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. IN CASE OF
EXPOSURE, OBTAIN MEDICAL ATTENTION IMMEDIATELY. WASH CONTAMINATED

CLOTHING BEFORE REUSE.

=====
===== Fire Fighting Measures =====

Extinguishing Media:NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT . PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:DO NOT BREATHE DUST. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE. TOXIC. IRRITANT. KEEP TIGHTLY CLOSED.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.

Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.

Protective Gloves:CHEMICAL-RESISTANT GLOVES.

Eye Protection:CHEMICAL WORKERS GOGGLES .

Other Protective Equipment:NONE SPECIFIED BY MANUFACTURER.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

NONE SPECIFIED BY MANUFACTURER.

=====
===== Physical/Chemical Properties =====

HCC:T2

Melt/Freeze Pt:M.P/F.P Text:1463F,795C

Spec Gravity:4.692

Appearance and Odor:BLUE-GREY GRANULAR POWDER

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

STRONG ACIDS

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.

=====
===== Disposal Considerations =====

Waste Disposal Methods:BURY IN A LANDFILL SITE APPROVED FOR THE DISPOSAL OF CHEMICAL AND HAZARDOUS WASTES. OBSERVE ALL FEDERAL, STATE, AND LOCAL LAWS.

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Material Safety Data Sheet

Molybdic acid p.a.

ACC# 96024

Section 1 - Chemical Product and Company Identification

MSDS Name: Molybdic acid p.a.

Catalog Numbers: AC213620000, AC213621000, AC213625000

Synonyms: Ammonium dimolybdate

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7782-91-4	Molybdic acid	100	231-970-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. The toxicological properties of this substance have not been fully investigated.

Inhalation: Causes respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep container closed when not in use.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Molybdcic acid	none listed	none listed	none listed

OSHA Vacated PELs: Molybdcic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves and clothing to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:300 deg C

Decomposition Temperature:Not available.

Solubility: 70 g/l (20 c)

Specific Gravity/Density:3.1000g/cm3

Molecular Formula:Not available.

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Strong bases, strong oxidizing agents.

Hazardous Decomposition Products: Irritating and toxic fumes and gases.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7782-91-4 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7782-91-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		

UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7782-91-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7782-91-4: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7782-91-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7782-91-4: No information available.

Canada - DSL/NDSL

CAS# 7782-91-4 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

N-(1-Naphthyl)Ethylenediamine Dihydrochloride

ACC# 88609

Section 1 - Chemical Product and Company Identification

MSDS Name: N-(1-Naphthyl)Ethylenediamine Dihydrochloride

Catalog Numbers: AC9477068

Synonyms: N-1-Naphthalenyl-1,2-Ethanediaminedihydrochloride

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1465-25-4	N-(1-Naphthyl)Ethylenediamine Dihydrochloride	100.0	215-981-2

Hazard Symbols: XI

Risk Phrases: 36/37/38

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: off-white solid. Causes respiratory tract irritation. Hygroscopic (absorbs moisture from the air). Light sensitive. May cause digestive tract irritation. **Warning!** Causes eye and skin irritation. Irritant.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Expected to be a low ingestion hazard.

Inhalation: Causes respiratory tract irritation. Can produce delayed pulmonary edema.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam. Do NOT get water inside containers.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Wash area with soap and water. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Store protected from light. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Store in a cool, dry place. Keep container closed when not in use. Store protected from moisture. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
N-(1-Naphthyl)Ethylenediamine Dihydrochloride	none listed	none listed	none listed

OSHA Vacated PELs: N-(1-Naphthyl)Ethylenediamine Dihydrochloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: off-white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:188-190C
Decomposition Temperature:200 deg C
Solubility: Slightly soluble in cold water.
Specific Gravity/Density:Not available.
Molecular Formula:C12H14N2.2HCl
Molecular Weight:259.0314

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1465-25-4: KV5330000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1465-25-4: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1465-25-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 1465-25-4: acute.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1465-25-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1465-25-4: No information available.

Canada - DSL/NDSL

CAS# 1465-25-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List**Exposure Limits**

CAROLINA BIOLOGICAL SUPPLY CO -- 87-6671, NAPHTHOL ALPHA SOLUTION -- -

=====
Product Identification
=====

Product ID:87-6671, NAPHTHOL ALPHA SOLUTION
MSDS Date:09/05/2000
FSC:NIIN:Submitter:D DG
Status Code:A
MSDS Number: CLGSY
=== Responsible Party ===
Company Name:CAROLINA BIOLOGICAL SUPPLY CO
Address:2700 YORK RD
City:BURLINGTON
State:NC
ZIP:27215-3387
Country:US
Info Phone Num:800-227-1150/910-584-0381
Emergency Phone Num:800-424-9300
Chemtrec Ind/Phone:(800)424-9300
CAGE:59896
=== Contractor Identification ===
Company Name:CAROLINA BIOLOGICAL SUPPLY CO
Address:2700 YORK RD
Box:City:BURLINGTON
State:NC
ZIP:27215-3387
Country:US
Phone:800-227-1150/910-584-0381
Contract Num:MDA414-01-P-1321
CAGE:59896

=====
Composition/Information on Ingredients
=====

Ingred Name:ETHYL ALCOHOL
CAS:64-17-5
RTECS #:KQ6300000
= Wt:85.5
OSHA PEL:1900 MG/M3;1000 PPM
ACGIH TLV:1880 MG/M3;1000 PPM

Ingred Name:METHYL ISOBUTYL KETONE (DENATURANT)
CAS:108-10-1
RTECS #:SA9275000
= Wt:3.6
OSHA PEL:410 MG/M3;100 PPM
ACGIH TLV:205 MG/M3;50 PPM
ACGIH STEL:307 MG/M3;75 PPM
EPA Rpt Qty:5000 LBS
DOT Rpt Qty:5000 LBS

Ingred Name:HEXANE (DENATURANT)
CAS:110-54-3
RTECS #:MN9275000
= Wt:.9
OSHA PEL:50 PPM
ACGIH TLV:50 PPM
EPA Rpt Qty:1 LB

DOT Rpt Qty:1 LB

Ingred Name: .ALPHA.-NAPHTHOL
CAS:90-15-3
RTECS #:QL2800000
= Wt:5.

=====
===== Hazards Identification =====

LD50 LC50 Mixture:ETHYL ALCOHOL: ORAL,RAT,LD50:7,060 MG/KG
Health Hazards Acute and Chronic:EMERGENCY OVERVIEW: MAY CAUSE IRRITATION TO EYES AND SKIN. LOCAL ACTION MAY PRODUCE PEELING OF THE SKIN WHICH MAY BE FOLLOWED BY PERSISTENT PIGMENTATION. CONSULT A PHYSICIAN UPON EXPOSURE. POTENTIAL HEALTH EFFECTS: EYES: MAY CAUSE IRRITATION. SKIN: MAY CAUSE IRRITATION. INGESTION: MAY CAUSE GASTROINTESTINAL DISCOMFORT. INHALATION: MAY CAUSE IRRITATION TO RESPIRATORY TRACT. TARGET ORGANS: KIDNEYS, LIVER, HEART, AND GI TRACT.
Explanation of Carcinogenicity:TOXICOLOGICAL PROPERTIES OF THIS MIXTURE HAVE NOT BEEN THOROUGHLY EVALUATED, SEE TOXICITY DATA FOR COMMENTS ON INDIVIDUAL COMPONENTS.
Effects of Overexposure:EYES: IRRITATION. SKIN: IRRITATION. INGESTION: GASTROINTESTINAL DISCOMFORT. INHALATION: IRRITATION TO RESPIRATORY TRACT.
Medical Conditions Aggravated by Exposure:KIDNEY, LIVER, HEART, AND GASTROINTESTINAL CONDITIONS.

=====
===== First Aid Measures =====

First Aid:EYES: FLUSH WITH WATER FOR 15 MINUTES, RAISING EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. SKIN: WASH EXPOSED AREA FOR 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND LAUNDRY BEFORE REUSE. GET MEDICAL ATTENTION. INGESTION: IF UNCONSCIOUS, GIVE PLENTY OF WATER AND INDUCE VOMITING AS DIRECTED BY MEDICAL PERSONNEL. CALL PHYSICIAN OR POISON CONTROL CENTER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. INHALATION: MOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF BREATHING STOPPED. KEEP PERSON WARM, QUIET, GET MEDICAL ATTENTION.

=====
===== Fire Fighting Measures =====

Flash Point Method:CC
Flash Point:13.1C, 55.6F
ETHYL ALCOHOL
Autoignition Temp:422.8C, 793.F
Autoignition Temp Text:ETHYL
Lower Limits:3.3%ETHYL AL
Upper Limits:19%ETHYL AL
Extinguishing Media:USE DRY CHEMICAL, CO2, OR APPROPRIATE FOAM.
Fire Fighting Procedures:FIREFIGHTERS SHOULD WEAR FULL PROTECTIVE EQUIPMENT AND NIOSH APPROVED SELF CONTAINED BREATHING APPARATUS.
Unusual Fire/Explosion Hazard:EXTREMELY FLAMMABLE. VAPORS ARE HEAVIER THAN AIR AND CAN TRAVEL DISTANCES TO IGNITION SOURCE AND FLASH BACK.

=====
===== Accidental Release Measures =====

Spill Release Procedures:VENTILATE AREA OF SPILL. ELIMINATE ALL SOURCES OF IGNITION. REMOVE ALL NON-ESSENTIAL PERSONNEL FROM AREA. CLEAN-UP PERSONNEL SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND CLOTHING. ABSORB MATERIAL WITH SUITABLE ABSORBENT AND CONTAINERIZE FOR DISPOSAL.

=====
===== Handling and Storage =====

Handling and Storage Precautions:THIS MATERIAL SHOULD BE KEPT IN AN AREA SUITABLE FOR STORAGE OF FLAMMABLE LIQUIDS. BOND AND GROUND CONTAINERS WHEN TRANSFERRING LIQUID. DO NOT BREATHE VAPOR. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHIN G.

Other Precautions:DO NOT TAKE INTERNALLY! WASH THOROUGHLY AFTER HANDLING. KEEP OXIDIZING MATERIAL AND STRONG ACIDS AWAY.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:A NIOSH/MSHA CHEMICAL CARTRIDGE RESPIRATOR SHOULD BE WORN IF PEL OR TLV IS EXCEEDED.

Ventilation:LOCAL EXHAUST: PREFERRED. MECHANICAL(GENERAL): ACCEPTABLE.

Protective Gloves:RUBBER, NEOPRENE, PVC, OR EQUIVALENT.

Eye Protection:WEAR SPLASH PROOF CHEMICAL SAFETY GOGGLES AT ALL TIMES.

Other Protective Equipment:LAB COAT, EYE WASH AND SAFETY SHOWER.

Supplemental Safety and Health

MSDS COVERS CAROLINA PRODUCT CODES: 87-6671; 87-6673. SIZE: 120ML; 500ML.

=====
===== Physical/Chemical Properties =====

HCC:F2

Boiling Pt:=25.8C, 78.5F

Melt/Freeze Pt:M.P/F.P Text:NO INFO

Vapor Pres:NO INFO

Vapor Density:1.59(AIR=1

Spec Gravity:<1 (H2O=1)

Evaporation Rate & Reference:1.70 (H2O=1)

Solubility in Water:95% (NAPHTHOL IS INSOLUBL

Appearance and Odor:DARK REDDISH, BROWN LIQUID; FRUITY ODOR.

Percent Volatiles by Volume:95%

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

OXIDIZERS, CONCENTRATED NITRIC, AND SULFURIC ACIDS, ALDEHYDES, HALOGENS.

Stability Condition to Avoid:HEAT, SPARKS, OPEN FLAME.

Hazardous Decomposition Products:CARBON DIOXIDE, CARBON MONOXIDE.

Conditions to Avoid Polymerization:WILL NOT OCCUR.

=====
===== Toxicological Information =====

Toxicological Information:TOXICOLOGICAL PROPERTIES OF THIS MIXTURE HAVE NOT BEEN THOROUGHLY EVALUATED. ETHYL ALCOHOL: ORAL, RAT, LD50:7,060 MG/KG; IHL, RAT, LC50: 20,000 PPM/ 10 HR. METHYL ISOBUTYL KETONE: ORAL, RAT, LD50: 5,0 80 MG/KG; IHL, RAT, LC50: 8,000 PPM/4H. HEXANE: ORAL, RAT, LD50: 28,710 MG/M3; INH, HMN TCLO: 5,000 PPM/ 10

M. ALPHA-NAPHTHOL: ORAL, RAT, LD50: 2,400 MG/KG; SKN, RBT, LD50: 880 MG/ KG. EFFECTS OF OVER EXPOSURE: CHRONIC: ETHYL ALCOHOL: MUTATION DAT CITED. REPRODUCTIVE EFFECTS DATA CITED. TUMORIGENIC DATA CITED. NOT LISTED AS CAUSING CANCER BY IARC, NTP, OR OSHA. METHYL ISOBUTYL KETONE: NO CHRONIC EF FECTS (CONTD. SEE "ECOLOGICAL")

=====
Ecological Information
=====

Ecological:EPA WASTE NUMBERS: ETHANOL, 95% D001. (CONTD. FROM "TOXICOLOGICAL") DATA FOUND. NOT LISTED AS CAUSING CANCER BY IARC, NTP, OR OSHA. HEXANE: MUTATION DATA CITED. REPRODUCTIVE EFFECTS DATA CITED. NOT LI STED AS CAUSING CANCER BY IARC, NTP, OR OSHA.

=====
Disposal Considerations
=====

Waste Disposal Methods:DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS. ALWAYS CONTACT A PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE.

=====
MSDS Transport Information
=====

Transport Information:DESCRIPTION: FLAMMABLE LIQUIDS, N.O.S. (ETHANOL, METHYL ISOBUTYL KETONE), HAZARD CLASS 3, UN 1993, PKG I I.

=====
Regulatory Information
=====

SARA Title III Information:HAZARD CATEGORY FOR SARA SECTION 311 / 312 REPORTING: ACUTE, FIRE. METHYL ISOBUTYL KETONE IS ON SARA SECTION 313 LIST.

Federal Regulatory Information:EPA TSCA STATUS: ON TSCA INVENTORY.

=====
Other Information
=====

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Material Safety Data Sheet

Neocuproine, 99%

ACC# 82389

Section 1 - Chemical Product and Company Identification

MSDS Name: Neocuproine, 99%

Catalog Numbers: AC153320000, AC153320050, AC153320250

Synonyms: 2,9-Dimethyl-1,10-Phenanthroline.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
484-11-7	Neocuproine	99%	207-601-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: off-white solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust

generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Neocuproine	none listed	none listed	none listed

OSHA Vacated PELs: Neocuproine: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: off-white

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 161 - 163 deg C

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula:C14H12N2.0.5H2O

Molecular Weight:217.27

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 484-11-7 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 484-11-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste

regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DOT regulated - small quantity provisions apply (see 49CFR173.4)	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 484-11-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 484-11-7: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 484-11-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 484-11-7: 1

Canada - DSL/NDSL

CAS# 484-11-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Nickel chloride

- Nickel(II) chloride hexahydrate
- Nickel dichloride

Formula NiCl₂



Description A brown or green colored solid.

Uses For nickel plating cast zinc, manufacture sympathetic ink, absorbent for nh3 in gas masks.

Registry Numbers and Inventories.

CAS 7718-54-9

NIH PubChem CID 24385

EC (EINECS/ELINCS) 231-743-0

EC Class R: 45-25-43, S: 53-45

RTECS QR6475000

RTECS class Tumorigen; Mutagen; Reproductive Effector

UN (DOT) 9139

Merck 12,6588

Beilstein/Gmelin 9303 (G)

Swiss Giftliste 1 G-2627

Canada DSL/NDSL DSL

US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	Cl ₂ Ni
Formula mass	129.60
Melting point, °C	1009
Boiling point, °C	985 sp
Sublimation point, °C	987 (730 torr)
Vapor pressure, mm_{Hg}	0.00022 (25 C)
Density	3.55 g/cm ³
Solubility in water	2540 g/L
Heat of fusion	38.3 kJ/mol

Hazards and Protection.

Storage Use ambient storage temperature and open venting. Keep well closed.

Handling	Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.
Protection	Goggles or face shield; protective gloves; bureau of mines approved respirator; protective clothing.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Keep material out of water sources and sewers. Apply water spray or mist to knock down vapors. Disperse vapors using fans or blowers. Land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. Cover solids with a plastic sheet to prevent dissolving in rain or fire fighting water. Neutralize with sodium bisulfate (NaHSO ₄). Water spill: Add sodium sulfate (Na ₂ SO ₄). Neutralize with dilute acid. Use natural deep water pockets, excavated lagoons, or sand bag barriers to trap material at bottom. Neutralize with agricultural lime (CaO), crushed limestone (CaCO ₃), or sodium bicarbonate (NaHCO ₃). Add sodium bisulfate (NaHSO ₄).
Stability	No data.
Incompatibilities	Reacts violent with potassium.
Decomposition	When heated to decomposition it emits very toxic fumes of hydrogen chloride. Toxic gases and vapors (such as nickel carbonyl) may be released.

Fire.

Fire fighting	Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Use foam, dry chemical, or carbon dioxide. Keep run-off water out of sewers and water sources.
Fire potential	Nonflammable
Hazards	Containers may explode when heated. Runoff may pollute waterways.
Combustion products	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

[NFPA](#)

Health

2

Flammability 0

Reactivity 0

Health.

Exposure limit(s) TLV (as Ni): ppm; 0.05 mg/m³ (ACGIH 1990-1991).

Carcinogen G-A4, I-1, N-1, CP65

Poison_Class 2

Exposure effects Acute intoxication of nickel carbonyl has two stages, immediate and delayed. A person may have a temperature as a delayed symptom, but it will seldom elevate above 101 degrees. Early symptoms after inhalation are dizziness, giddiness, and weakness. Nickel salts are reported to be animal teratogens. Increased incidence of stillbirth and neonatal mortality of rat offspring were associated with maternal consumption of nickel chloride solutions prior to mating and during gestation. Nickel has been found in breast milk. ORAL ADMINISTRATION of nickel sulphate to rats caused decreased testicular, prostate, and seminal vesicle size as well as abnormalities of sperm and decreased sperm count.

Ingestion Large doses taken orally or by inhalation may cause nausea, vomiting, and diarrhea.

Inhalation Highly toxic, may be fatal if inhaled, swallowed or absorbed through skin. Effects of contact or inhalation may be delayed.

Skin Avoid any skin contact. See Inhalation.

Eyes See Inhalation.

First aid

Ingestion The possible benefit of early removal of some ingested material by cautious gastric lavage must be weighed against potential complications of bleeding or perforation. Activated charcoal binds most toxic agents and can decrease their systemic absorption if administered soon after ingestion. Activated charcoal: administer charcoal as a slurry (240 ml water/30 g charcoal). Usual dose: 25 to 100 g

in adults/adolescents.

Inhalation Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.

Skin Remove and isolate contaminated clothing and shoes. Remove material from skin immediately. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.

Eyes Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 9139

Response guide [151](#)

Hazard class 6.1



USCG CHRIS Code NCL

Std. Transport # 4925230

Material Safety Data Sheet

Nickel (II) Chloride Hexahydrate, P.A.

ACC# 96310

Section 1 - Chemical Product and Company Identification

MSDS Name: Nickel (II) Chloride Hexahydrate, P.A.

Catalog Numbers: AC270510000, AC270510010

Synonyms: Nickelous Chloride; Nickel Dichloride.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7791-20-0	Nickel (II) Chloride Hexahydrate	ca 100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Warning! Toxic. Harmful if swallowed. May cause allergic skin reaction. May cause respiratory and digestive tract irritation. Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause severe skin irritation and possible burns. May cause cancer based on animal studies. Potential cancer hazard.

Target Organs: Respiratory system.

Potential Health Effects

Eye: May cause eye irritation and possible burns.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause severe irritation and possible burns. May cause dermatitis. Causes "nickel itch" which is a dermatitis resulting from sensitization to nickel, which is characterized by skin eruptions, followed by discrete ulcers that may discharge and become crusted, or by eczema.

Ingestion: Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting

and diarrhea.

Inhalation: Inhalation of a mist of this material may cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause respiratory tract cancer. Symptoms of overexposure to nickel can cause sensitization, dermatitis, allergic asthma and pneumonitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Noncombustible.

Autoignition Temperature: Noncombustible.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Reduce airborne dust and prevent scattering by moistening with water. Clean up spills

immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Carefully scoop up and place into appropriate disposal container.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Nickel (II) Chloride Hexahydrate	none listed	0.015 mg/m ³ TWA (as Ni excluding Nickel carbonyl) (listed under Nickel compounds). 10 mg/m ³ IDLH (as Ni except Nickel carbonyl) (listed under Nickel compounds).	1 mg/m ³ TWA (as Ni) (listed under Nickel soluble compounds).

OSHA Vacated PELs: Nickel (II) Chloride Hexahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: green
Odor: odorless
pH: 4.0 (aqueous sol)
Vapor Pressure: 1 mm Hg @1140F
Vapor Density: Not available.
Evaporation Rate: Negligible
Viscosity: Not available.
Boiling Point: 1783 deg F
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: 3.55 (water=1)
Molecular Formula: NiCl₂·6H₂O
Molecular Weight: 237.6764

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong acids, peroxides, potassium.

Hazardous Decomposition Products: Hydrogen chloride, nickel oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7791-20-0: QR6480000

LD50/LC50:

CAS# 7791-20-0:

Oral, rat: LD50 = 105 mg/kg; <BR.

Carcinogenicity:

CAS# 7791-20-0:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/7/04 (listed as Nickel compounds).
- **NTP:** Known carcinogen (listed as Nickel compounds).
- **IARC:** Group 1 carcinogen (listed as Nickel compounds).

Epidemiology: IARC Group 2B: Proven animal carcinogenic substance of potential relevance to humans. IARC Group 2B: No data available on human carcinogenicity, however sufficient evidence of carcinogenicity in animals. Epidemiological studies have shown an increased incidence of cancers among nickel refinery workers. An increased incidence of lung and nasal cavity cancers has been noted among women in nickel smelters and refineries.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Cytogenetic Analysis: mouse mammary gland 800umol/L. Sister Chromatid Exchange: hamster fibroblast 32mg/L.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLID, INORGANIC, N.O.S.	TOXIC SOLID INORGANIC NOS (NICKEL CHLORIDE HEXAHYDRATE)
Hazard Class:	6.1	6.1
UN Number:	UN3288	UN3288
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7791-20-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7791-20-0: acute, chronic.

Section 313

This material contains Nickel (II) Chloride Hexahydrate (listed as Nickel compounds), ca 100%, (CAS# 7791-20-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7791-20-0 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7791-20-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7791-20-0 can be found on the following state right to know lists: California, (listed as Nickel compounds), Pennsylvania, (listed as Nickel compounds), Minnesota, (listed as Nickel soluble compounds).

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Nickel (II) Chloride Hexahydrate, listed as 'Nickel compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 25 Toxic if swallowed.

R 20 Harmful by inhalation.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7791-20-0: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list. **Canada - WHMIS**

This product has a WHMIS classification of D1B, D2A.

Canadian Ingredient Disclosure List

CAS# 7791-20-0 (listed as Nickel soluble compounds) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Nickel(II) oxide

ACC# 96311

Section 1 - Chemical Product and Company Identification

MSDS Name: Nickel(II) oxide

Catalog Numbers: AC223120000, AC223120050, AC223121000, AC223125000, AC415580000, AC415585000, N69-100, N69-500

Synonyms: Nickel oxide; Nickel monoxide; Nickelous oxide; Green nickel oxide; Nickel protoxide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1313-99-1	Nickel monoxide	100	215-215-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green powder.

Warning! Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction. May cause cancer by inhalation.

Target Organs: Lungs, respiratory system, eyes, skin.

Potential Health Effects

Eye: Dust may cause mechanical irritation. Causes eye irritation.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause dermatitis.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Causes respiratory tract irritation. May cause allergic respiratory reaction.
Chronic: Repeated inhalation is associated with nasal and nasopharyngeal cancer.
Symptoms of overexposure to nickel can cause sensitization, dermatitis, allergic asthma and pneumonitis.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe dust. Use only with adequate ventilation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Nickel monoxide	0.2 mg/m ³ TWA (inhalable fraction, as Ni) (listed under Nickel, inorganic compounds, insoluble).	0.015 mg/m ³ TWA (as Ni, except Nickel carbonyl) (listed under Nickel compounds). 10 mg/m ³ IDLH (as Ni, except Nickel carbonyl) (listed under Nickel compounds).	1 mg/m ³ TWA (as Ni) (listed under Nickel insoluble compounds). 1 mg/m ³ TWA (as Ni) (listed under Nickel soluble compounds).

OSHA Vacated PELs: Nickel monoxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: green

Odor: odorless

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.
Freezing/Melting Point: 1960 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density: 6.67
Molecular Formula: NiO
Molecular Weight: 74.7

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Fluorine, hydrogen sulfide.
Hazardous Decomposition Products: None.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 1313-99-1; QR8400000; QR8430000
LD50/LC50:
Not available.
Oral rat LDLo: 5000 mg/kg. (RTECS)
Carcinogenicity:
CAS# 1313-99-1:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Nickel, inorganic compounds, insoluble').
- **California:** carcinogen, initial date 10/1/89
- **NTP:** Known carcinogen (listed as Nickel compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLID, INORGANIC, N.O.S.*	Not Regulated
Hazard Class:	6.1	
UN Number:	UN3288	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1313-99-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1313-99-1: immediate, delayed.

Section 313

This material contains Nickel monoxide (listed as Nickel compounds), 100%, (CAS# 1313-99-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 1313-99-1 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 1313-99-1 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1313-99-1 can be found on the following state right to know lists: California, (listed as Nickel compounds), New Jersey, Pennsylvania, Minnesota, (listed as Nickel insoluble compounds), Minnesota, (listed as Nickel soluble compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Nickel monoxide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 43 May cause sensitization by skin contact.

R 49 May cause cancer by inhalation.

R 53 May cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 1313-99-1: 3

Canada - DSL/NDSL

CAS# 1313-99-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1313-99-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Nickel (II) sulfate hexahydrate

ACC# 16410

Section 1 - Chemical Product and Company Identification

MSDS Name: Nickel (II) sulfate hexahydrate

Catalog Numbers: AC211080000, AC211081000, AC211085000, AC415610000, AC415610050, AC415615000, S76472, S76475, N72-3, N73-100, N73-500

Synonyms: Nickel monosulfate hexahydrate; Nickel sulfate hexahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10101-97-0	Nickel (II) sulfate hexahydrate	98+	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: blue-green crystals.

Warning! Harmful if swallowed. Causes eye irritation. May cause allergic respiratory and skin reaction. Cancer hazard. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Target Organs: Respiratory system, skin.

Potential Health Effects

Eye: Causes mild eye irritation.

Skin: May be harmful if absorbed through the skin. May cause sensitization by skin contact.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract.

Inhalation: May be harmful if inhaled. May cause respiratory sensitization. May cause an asthma-like allergy. Future exposures can cause asthma attacks with shortness of breath, wheezing, cough and chest tightness.

Chronic: May cause cancer in humans. Prolonged or repeated exposure may cause sensitization in certain sensitive individuals. Repeated exposure may cause scarring of the lungs and may affect the

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Noncombustible

Autoignition Temperature: Noncombustible

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use only in a chemical fume hood.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Nickel (II) sulfate hexahydrate	0.1 mg/m ³ TWA (inhalable fraction, as Ni) (listed under Nickel, inorganic compounds, soluble).	0.015 mg/m ³ TWA (as Ni, except Nickel carbonyl) (listed under Nickel compounds). 10 mg/m ³ IDLH (as Ni, except Nickel carbonyl) (listed under Nickel compounds).	1 mg/m ³ TWA (as Ni) (listed under Nickel soluble compounds).
Nickel (II) sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Nickel (II) sulfate hexahydrate: No OSHA Vacated PELs are listed for this chemical. Nickel (II) sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: blue-green

Odor: odorless

pH: 4 - 6 (5% aq. sol.)
Vapor Pressure: Negligible
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 103 deg C
Freezing/Melting Point: 53 deg C
Decomposition Temperature: > 280 deg C
Solubility: 625 g/L (20°C)
Specific Gravity/Density: 2.07 (water=1)
Molecular Formula: NiSO₄·6H₂O
Molecular Weight: 262.85

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Oxides of sulfur, nickel oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10101-97-0: QR9600000

CAS# 7786-81-4: QR9350000

LD50/LC50:

CAS# 10101-97-0:

Oral, rat: LD50 = 264 mg/kg;

.

CAS# 7786-81-4:

Draize test, rabbit, skin: 5%;

.

Carcinogenicity:

CAS# 10101-97-0:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/7/04 (listed as Nickel compounds).
- **NTP:** Known carcinogen (listed as Nickel compounds).
- **IARC:** Group 1 carcinogen

CAS# 7786-81-4:

- **ACGIH:** Not listed.
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 1 carcinogen

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: Paternal Effects: intraperitoneal-rat TDLo=403mg/kg.

Mutagenicity: Please refer to RTECS QR9600000 for mutation data and references.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Prawn (salt water) LC50=13.9ppm/48H Rainbow trout (fresh water) TLm=160ppm/48H

Environmental: Nickel is very mobile in aquatic environment and shows potential for bioaccumulation.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S. (NICKEL SULFATE)	TOXIC SOLIDS, ORGANIC, N.O.S. (NICKEL SULFATE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10101-97-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7786-81-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7786-81-4: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10101-97-0: immediate, delayed.

Section 313

This material contains Nickel (II) sulfate hexahydrate (listed as Nickel compounds), 98+%, (CAS# 10101-97-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 10101-97-0 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7786-81-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

CAS# 10101-97-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10101-97-0 can be found on the following state right to know lists: California, (listed as Nickel compounds), New Jersey, (listed as Nickel compounds), Pennsylvania, (listed as Nickel compounds), Minnesota, (listed as Nickel soluble compounds).

CAS# 7786-81-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Nickel (II) sulfate hexahydrate, listed as Nickel

compounds', a chemical known to the state of California to cause cancer.
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.

R 40 Limited evidence of a carcinogenic effect.

R 42/43 May cause sensitization by inhalation and skin contact.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 36/37 Wear suitable protective clothing and gloves.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 10101-97-0: 2

CAS# 7786-81-4: No information available.

Canada - DSL/NDSL

CAS# 7786-81-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10101-97-0 (listed as Nickel soluble compounds) is listed on the Canadian Ingredient Disclosure List.

CAS# 7786-81-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ninhydrin Reagent

ACC# 88864

Section 1 - Chemical Product and Company Identification

MSDS Name: Ninhydrin Reagent

Catalog Numbers: M-152, M152, MCC-030408

Synonyms: None

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
	Ethyl glycol monomethyl ether	75.0	unlisted
127-09-3	Sodium acetate anhydrous	8.60	204-823-8
64-19-7	Glacial acetic acid	2.5	200-580-7
7732-18-5	Water	Balance	231-791-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid.

Warning! Harmful if absorbed through the skin. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause blood abnormalities. May cause central nervous system depression. May cause liver and kidney damage. May cause reproductive and fetal effects.

Target Organs: None.

Potential Health Effects

Eye: Causes eye irritation. May cause irreversible eye injury.

Skin: Causes skin irritation.

Ingestion: May cause central nervous system depression, kidney damage, and liver damage. Symptoms may include: headache, excitement, fatigue, nausea, vomiting, stupor, and coma. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Exposure may cause anemia and other blood abnormalities.

Inhalation: May cause respiratory tract irritation. May cause effects similar to those described for ingestion. May cause dyspnea (difficult or labored breathing).

Chronic: May cause bone marrow abnormalities with damage to blood forming tissues. May cause anemia and other blood cell abnormalities. May cause reproductive and fetal effects.

Section 4 - First Aid Measures

Eyes: Get medical aid. Gently lift eyelids and flush continuously with water.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethyl glycol monomethyl ether	none listed	none listed	none listed
Sodium acetate anhydrous	none listed	none listed	none listed
Glacial acetic acid	10 ppm TWA; 15 ppm STEL	10 ppm TWA; 25 mg/m ³ TWA 50 ppm IDLH	10 ppm TWA; 25 mg/m ³ TWA
Water	none listed	none listed	none listed

OSHA Vacated PELs: Ethyl glycol monomethyl ether: No OSHA Vacated PELs are listed for this chemical. Sodium acetate anhydrous: No OSHA Vacated PELs are listed for this chemical. Glacial acetic acid: 10 ppm TWA; 25 mg/m³ TWA Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear, colorless

Odor: alcohol-like - weak odor
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: Not available.
Specific Gravity/Density:Not available.
Molecular Formula:Mixture
Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: None reported.
Incompatibilities with Other Materials: There is no information for any incompatibilities for this substance.
Hazardous Decomposition Products: Irritating and toxic gases.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# unlisted.
CAS# 127-09-3: AJ4300010
CAS# 64-19-7: AF1225000
CAS# 7732-18-5: ZC0110000
LD50/LC50:
Not available.

CAS# 127-09-3:
Draize test, rabbit, eye: 10 mg Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, rat: LC50 = >30 gm/m³/1H;
Oral, mouse: LD50 = 6891 mg/kg;
Oral, rat: LD50 = 3530 mg/kg;
Skin, rabbit: LD50 = >10 gm/kg;

CAS# 64-19-7:
Draize test, rabbit, skin: 50 mg/24H Mild;
Inhalation, mouse: LC50 = 5620 ppm/1H;

Oral, rat: LD50 = 3310 mg/kg;
Skin, rabbit: LD50 = 1060 uL/kg;

CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;

Carcinogenicity:

CAS# : Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 127-09-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 64-19-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information reported.
Physical: No information available.
Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.

Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# is not listed on the TSCA inventory. It is for research and development use only.
CAS# 127-09-3 is listed on the TSCA inventory.
CAS# 64-19-7 is listed on the TSCA inventory.
CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 64-19-7: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 64-19-7: immediate, delayed, fire.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depleters.
This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 64-19-7 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# is not present on state lists from CA, PA, MN, MA, FL, or NJ.
CAS# 127-09-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
CAS# 64-19-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# : No information available.

CAS# 127-09-3: 1

CAS# 64-19-7: 1

CAS# 7732-18-5: No information available.

Canada - DSL/NDSL

CAS# 127-09-3 is listed on Canada's DSL List.

CAS# 64-19-7 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 64-19-7 is listed on the Canadian Ingredient Disclosure List.

CITY CHEMICAL CORPORATION -- SILVER NITRATE ACS REAGENT -- 6810-00-233-0124

=====
Product Identification
=====

Product ID:SILVER NITRATE ACS REAGENT
MSDS Date:08/25/1995
FSC:6810
NIIN:00-233-0124
MSDS Number: BJYTF
=== Responsible Party ===
Company Name:CITY CHEMICAL CORPORATION
Address:232 W.22ND STREET
City:NEW YORK
State:NY
ZIP:10011-2418
Country:US
Info Phone Num:201-653-6900/FAX -4468
Emergency Phone Num:201-653-6900/800-424-9300 (CHEMTREC)
CAGE:83628

==== Contractor Identification ====

Company Name:CITY CHEMICAL CORPORATION
Address:100 HOBOKEN AVE
City:JERSEY CITY
State:NJ
ZIP:07310
Country:US
Phone:201-653-6900/800-248-2436
CAGE:83628

=====
Composition/Information on Ingredients
=====

Ingred Name:SILVER NITRATE (SARA 313) (CERCLA)
CAS:7761-88-8
RTECS #:VW4725000
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:0.01 MG(AG)/M3
ACGIH TLV:0.01 MG(AG)/M3; 9596
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:UNKNOWN IARC:UNKNOWN OSHA:NO
Health Hazards Acute and Chronic:ACUTE: MAY BE FATAL IF INHALED,
ABSORBED BY SKIN OR SWALLOWED. EXTREMELY DESTRUCTIVE TO TISSUES OF
MUCOUS MEMBRANES, UPPER RESPIRATORY TRACT, EYES & SKIN. MAY CAUSE
ARGYRIA. CHRONIC: LAB RESULTS HAVE SHOWN MUTAGENIC EFFECTS. TO
THE BEST OF MFR'S KNOWLEDGE, TOXICOLOGICAL, CHEMICAL & PHYSICAL
PROPERTIES NOT FULLY KNOWN.
Explanation of Carcinogenicity:NO DATA FOUND ON CARCINOGENICITY IN MFR
MSDS.
Effects of Overexposure:INHALED/SKIN ABSORBED/INGESTED-FATAL.
INHALED-SPASM, INFLAMMATION, EDEMA OF LARYNX & BRONCHI, BURNING

SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH,
HEADACHE, NAUSEA, VOMITING.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:IN ALL CASES GET MEDICAL ATTENTION. EYES-FLUSH WITH WATER FOR
15 MINUTES. SKIN-REMOVE CONTAMINATED CLOTHES. WASH WITH WATER.
INHALED-REMOVE TO FRESH AIR. ADMINISTER OXYGEN OR ARTIFICIAL
RESPIRATION AS NEEDED. INGESTED-IF CONSCIOUS, WASH OUT MOUTH WITH
WATER. CALL A PHYSICIAN. WASH CONTAMINATED CLOTHES BEFORE REUSE.
DISCARD CONTAMINATED SHOES.

=====
===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY.
Fire Fighting Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS AND
FULL FIRE FIGHTER'S PROTECTIVE GEAR.
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.

=====
===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR SELF-CONTAINED BREATHING
APPARATUS, BOOTS & HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG
AND HOLD FOR WASTE DISPOSAL. VENTILATE AREA. WASH SPILL SITE AFTER
MATERIAL PICK-UP IS COMPLETE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:KEEP TIGHTLY CLOSED. KEEP AWAY FROM
COMBUSTIBLE MATERIALS, HEAT, SPARKS, & OPEN FLAME. LIGHT SENSITIVE.
STORE IN A COOL, DRY PLACE.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:IF ENGINEERING CONTROLS FAIL OR NON-ROUTINE USE
OR AN EMERGENCY OCCURS; WEAR AN MSHA/NIOSH APPROVED RESPIRATOR OR
AN AIR-SUPPLIED RESPIRATOR OR SCBA, AS REQUIRED. USE IAW 29 CFR
1910.134.
Ventilation:USE ADEQUATE MECHANICAL VENTILATION OR LOCAL EXHAUST TO
MAINTAIN EXPOSURE BELOW TLV(S).
Protective Gloves:NEOPRENE.
Eye Protection:SAFETY GLASSES/CHEMICAL SPLASH GOGGLES.
Other Protective Equipment:EYE WASH STATION & SAFETY SHOWER. OTHER
PROTECTIVE CLOTHING AS NEEDED TO PREVENT PROLONGED OR REPEATED SKIN
CONTACT.
Work Hygienic Practices:WASH HANDS AFTER HANDLING AND BEFORE EATING,
DRINKING, OR SMOKING. LAUNDRY CONTAMINATED CLOTHES BEFORE REUSE.
Supplemental Safety and Health
DATA WAS COPIED FROM RECORD OF NSN:6810-00-233-0126 FROM CITY CHEMICAL
COMPANY.

=====
===== Physical/Chemical Properties =====

HCC:D1
Melt/Freeze Pt:M.P/F.P Text:414F,212C
Vapor Density:5.8
Spec Gravity:4.352
Appearance and Odor:WHITE CRYSTALS.

===== Stability and Reactivity Data =====

STRONG REDUCING AGENTS, AMMONIA, STRONG BASES, ALCOHOLS, MAGNESIUM,
ARSENIC, CHLORIDES, CARBONATES, THIOCYANATES.....
Stability Condition to Avoid:MAY DECOMPOSE ON EXPOSURE TO LIGHT.
Hazardous Decomposition Products:NITROGEN OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:CATALYSTS AND EXPENSIVE METALS SHOULD BE
RECOVERED FOR REUSE OR RECYCLING.

Disclaimer (provided with this information by the compiling agencies):
This information is formulated for use by elements of the Department
of Defense. The United States of America in no manner whatsoever,
expressly or implied, warrants this information to be accurate and
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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Norcamphor, 99%

ACC# 39244

Section 1 - Chemical Product and Company Identification

MSDS Name: Norcamphor, 99%

Catalog Numbers: AC129250000, AC129250050, AC129250250, AC129251000

Synonyms: 2-Norbornanone; Bicyclo[2.2.1]Heptan-2-One; 2-Oxonorbornanone.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
497-38-1	Norcamphor	99	207-846-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless crystals. Flash Point: 33 deg C.

Warning! Flammable solid. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. Inhalation of dust may cause respiratory tract

irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable solid.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

Flash Point: 33 deg C (91.40 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Flammables-area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Norcamphor	none listed	none listed	none listed

OSHA Vacated PELs: Norcamphor: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: colorless

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 168-172 deg C @ 760.00mmHg
Freezing/Melting Point: 88.00 - 91.00 deg C
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density: Not available.
Molecular Formula: C7H10O
Molecular Weight: 110.16

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 497-38-1: RB7680000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 497-38-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	FLAMMABLE SOLIDS, ORGANIC, N.O.S.	No information available.
Hazard Class:	4.1	
UN Number:	UN1325	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 497-38-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 497-38-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:

R 10 Flammable.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 33 Take precautionary measures against static discharges.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 9 Keep container in a well-ventilated place.

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 497-38-1: No information available.

Canada - DSL/NDSL

CAS# 497-38-1 is listed on Canada's NDSL List.

Canada - WHMIS

WHMIS: Not available.

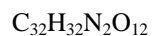
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

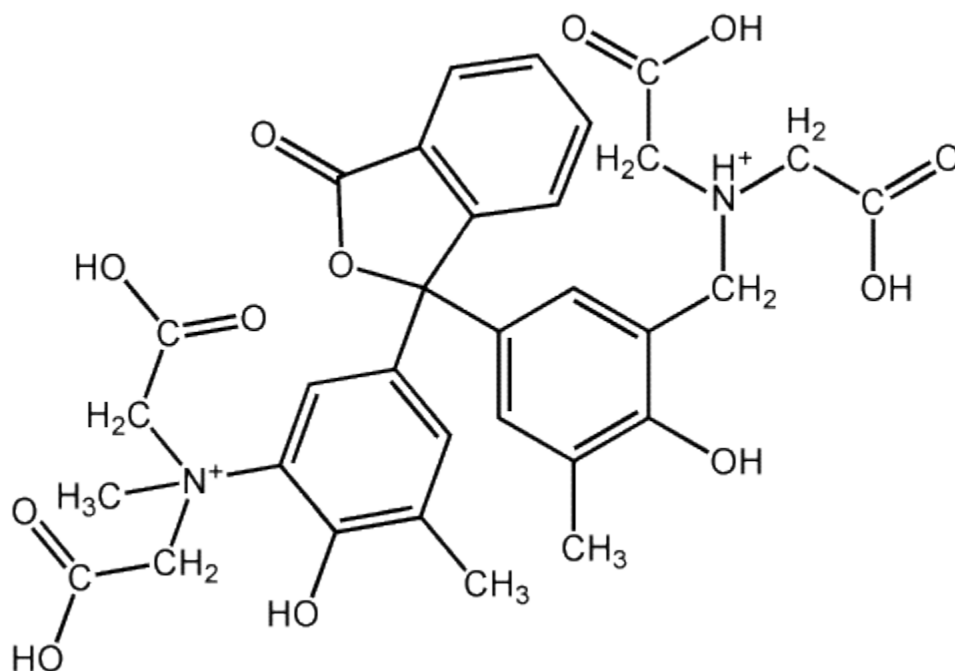
o-Cresolphthalein complexone

- Glycine, N,N'-[(3-oxo-1(3H)-isobenzofuranylidene)bis[(6-hydroxy-5-methyl-3,1-phenylene)methylene]]bis[N-(carboxymethyl)-
- 1,3-Dihydro-3-oxoisobenzofuran-1-ylidenebis(6-hydroxy-5-methyl-m-phenylenemethylenenitrilo)tetraacetic acid
- 2-[[5-[1-[3-[(Bis(carboxymethyl)amino)methyl]-4-hydroxy-5-methyl-phenyl]-3-oxo-isobenzofuran-1-yl]-2-hydroxy-3-methyl-phenyl]methyl-(carboxymethyl)amino]acetic acid
- Cresolphthalexon

Formula



Structure



Description

White to light yellow solid.

Uses

Complexing agent.

Registry Numbers and Inventories.

CAS	2411-89-4
NIH PubChem CID	75485
EC (EINECS/ELINCS)	219-318-8
EC Class	S: 22 24/25
Beilstein/Gmelin	381994
Beilstein Reference	4-18-00-08141
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed

Korea ECL Listed

Properties.

Formula	C32H32N2O12
Formula mass	636.62
Melting point, °C	186
Solubility in water	Insoluble

Hazards and Protection.

Storage	Store in a cool, dry place. Store in a tightly closed container.
Handling	Wash thoroughly after handling. Wash hands before eating. Use with adequate ventilation. Avoid breathing dust, vapor, mist, or gas. Avoid contact with skin and eyes. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment.
Disposal code	3
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents.
Decomposition	Carbon monoxide, oxides of nitrogen, carbon dioxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. To extinguish fire use water spray, dry chemical, carbon dioxide, or chemical foam.
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Health.

Exposure effects

Ingestion	May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.
Inhalation	May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Skin May cause skin irritation.

Eyes May cause eye irritation.

First aid

Ingestion Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Skin Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

HS Code

2932 29 80

Material Safety Data Sheet

Oil red o (cert)

ACC# 60709

Section 1 - Chemical Product and Company Identification

MSDS Name: Oil red o (cert)

Catalog Numbers: AC416510000, AC416510250, BP112-10

Synonyms: CI Solvent Red 27; D&C Red #18; 2-Naphthalenol

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1320-06-5	Oil red O	100	215-295-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Not available.

Caution! May cause irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: No information regarding eye irritation and other potential effects was found. Contact may cause transient eye irritation.

Skin: No information regarding skin irritation and other potential effects was found.

Ingestion: The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Oil red O	none listed	none listed	none listed

OSHA Vacated PELs: Oil red O: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: Not available.

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: C₂₆H₂₄N₄O

Molecular Weight: 408.50

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1320-06-5 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1320-06-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1320-06-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1320-06-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 1320-06-5: No information available.

Canada - DSL/NDSL

CAS# 1320-06-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Oleic acid

ACC# 17305

Section 1 - Chemical Product and Company Identification

MSDS Name: Oleic acid

Catalog Numbers: AC270290000, AC270290050, AC378620000, S80110, S93316, A195-500, A195B-500, NC9368066, XXA19520LI

Synonyms: cis-9-Octadecenoic acid; red oil; a monounsaturated fatty acid; a component of almost all natural fats.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
112-80-1	Oleic acid	>97	204-007-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to pale red liquid.

Warning! Causes eye, skin, and respiratory tract irritation. Air sensitive. Light sensitive.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin. Prolonged or repeated contact may dry/defat the skin and cause irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Liquid will float and may reignite on the surface of water.

Extinguishing Media: Water or foam may cause frothing. Use dry chemical or carbon dioxide.

Flash Point: 184 deg C (363.20 deg F)

Autoignition Temperature: 363 deg C (685.40 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse. Avoid contact with air and sunlight.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Absorbs oxygen from the air and will darken upon exposure.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Oleic acid	none listed	none listed	none listed

OSHA Vacated PELs: Oleic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: colorless to pale red

Odor: lardlike

pH: Not available.

Vapor Pressure: 1 mm Hg @ 177 deg C

Vapor Density: 9.7 (air=1)

Evaporation Rate: Negligible.

Viscosity: Not available.
Boiling Point: 360 deg C
Freezing/Melting Point:13.4 deg C
Decomposition Temperature:80-100 deg C
Solubility: Insoluble.
Specific Gravity/Density:0.895 (water=1)
Molecular Formula:C18H34O2
Molecular Weight:282.46

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Darkens on exposure to air. On exposure to air, acquires rancid odor.

Conditions to Avoid: High temperatures, incompatible materials, light, exposure to air, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, perchloric acid, powdered aluminum.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 112-80-1: RG2275000

LD50/LC50:

CAS# 112-80-1:

Draize test, rabbit, eye: 100 mg Mild;

Oral, mouse: LD50 = 28 gm/kg;

Oral, rat: LD50 = 25 gm/kg;

Human Skin Draize 15 mg/3D intermittent; REACTION: Moderate.

Carcinogenicity:

CAS# 112-80-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 205 mg/L; 96 Hr.; Static condition

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 112-80-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 112-80-1 can be found on the following state right to know lists: Pennsylvania.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 112-80-1: 1

Canada - DSL/NDSL

CAS# 112-80-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 112-80-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

2-Isonitrosoacetophenone, 99%

ACC# 95237

Section 1 - Chemical Product and Company Identification

MSDS Name: 2-Isonitrosoacetophenone, 99%

Catalog Numbers: AC122630000, AC122630050, AC122630250

Synonyms: 2-Hydroxyiminoacetophenone; Acetophenone, 2-hydroxyimino-;
Benzeneacetaldehyde, alpha-oxo-, aldoxime; Glyoxal, 1-phenyl-, 2-oxime;
Isonitrosoacetophenone

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
532-54-7	2-Isonitrosoacetophenone	99	208-539-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: beige to yellow powder.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Causes respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.)

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2-Isonitrosoacetophenone	none listed	none listed	none listed

OSHA Vacated PELs: 2-Isonitrosoacetophenone: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: beige to yellow

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 5.14

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 126.00 - 128.00 deg C

Decomposition Temperature: Not available.

Solubility: soluble in hot water

Specific Gravity/Density: Not available.

Molecular Formula: C₈H₇NO₂

Molecular Weight: 149.15

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, strong acids.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide, nitrogen gas.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 532-54-7: MD3325000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 532-54-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Material Safety Data Sheet

Orange G

ACC# 60420

Section 1 - Chemical Product and Company Identification

MSDS Name: Orange G

Catalog Numbers: O267-25

Synonyms: Acid Fast Orange G, Acid Light Orange G; Acid Orange G; C.I. 27; C.I. 16230; Acid Orange 10; C.I. Food Orange 4; Napthalene Fast O

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1936-15-8	Acid Orange 10	ca. 100	217-705-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow-red to orange solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause adverse reproductive effects based upon animal studies. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation. This product contains an anionic dye. Similar dyes have not caused injury to the cornea or conjunctiva in documented exposure cases with human or rabbit eyes.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material. Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acid Orange 10	none listed	none listed	none listed

OSHA Vacated PELs: Acid Orange 10: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow-red to orange

Odor: weak odor

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:141 deg C
Decomposition Temperature:Not available.
Solubility: Soluble in water.
Specific Gravity/Density:0.45-0.47
Molecular Formula:C₁₆H₁₀N₂O₇S₂.2Na
Molecular Weight:452.1788

Section 10 - Stability and Reactivity

Chemical Stability: Materials containing similar structural groups are normally stable.
Conditions to Avoid: Incompatible materials, dust generation, excess heat.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide, nitrogen oxides (NO_x) and ammonia (NH₃).
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 1936-15-8: QJ6500000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 1936-15-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1936-15-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1936-15-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 1936-15-8: No information available.

Canada - DSL/NDSL

CAS# 1936-15-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1936-15-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Orcinol monohydrate

ACC# 17325

Section 1 - Chemical Product and Company Identification

MSDS Name: Orcinol monohydrate

Catalog Numbers: AC129550000, AC129550250, AC129551000, AC416590000, AC416591000, S801121, O244-25

Synonyms: 3,5-Dihydroxytoluene ; 5-Methyl-1,3-benzenediol; 5-Methylresorcinol monohydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6153-39-5	Orcinol monohydrate	99+	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red solid.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if swallowed.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Do not store in direct sunlight. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Orcinol monohydrate	none listed	none listed	none listed
Resorcinol, 5-methyl-	none listed	none listed	none listed

OSHA Vacated PELs: Orcinol monohydrate: No OSHA Vacated PELs are listed for this chemical. Resorcinol, 5-methyl-: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white - brown - red

Odor: none reported

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: 290 deg C @ 760 mmHg

Freezing/Melting Point: 56 - 61 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C7H10O3

Molecular Weight: 142.15

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive. Light sensitive.

Conditions to Avoid: Incompatible materials, light, dust generation, exposure to air, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, acid chlorides, acid anhydrides.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6153-39-5 unlisted.

CAS# 504-15-4: VH2100000

LD50/LC50:

Not available.

CAS# 504-15-4:

Oral, mouse: LD50 = 770 mg/kg;

Oral, rabbit: LD50 = 2400 mg/kg;

Oral, rat: LD50 = 844 mg/kg;

Carcinogenicity:

CAS# 6153-39-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 504-15-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6153-39-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 504-15-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 6153-39-5: immediate, delayed.

CAS # 504-15-4: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6153-39-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 504-15-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 6153-39-5: No information available.

CAS# 504-15-4: No information available.

Canada - DSL/NDSL

CAS# 504-15-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Palmitic acid

ACC# 66262

Section 1 - Chemical Product and Company Identification

MSDS Name: Palmitic acid

Catalog Numbers: AC129700000, AC129700010, AC416690000, AC416691000, AC416695000

Synonyms: Hexadecanoic acid.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
57-10-3	Palmitic acid	90+	200-312-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: almost white flakes.

Warning! Causes eye and skin irritation.

Target Organs: Eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 206 deg C (402.80 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Palmitic acid	none listed	none listed	none listed

OSHA Vacated PELs: Palmitic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Flakes

Appearance: white - almost white

Odor: Not available.

pH: Not applicable.

Vapor Pressure: Negligible

Vapor Density: Not available.

Evaporation Rate: Negligible

Viscosity: 7.8mPas @ 70C

Boiling Point: 351.5 deg C @ 760 mmHg

Freezing/Melting Point: 59 - 63 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 0.850

Molecular Formula: C16H32O2

Molecular Weight: 256.42

Section 10 - Stability and Reactivity

Chemical Stability: Light sensitive.

Conditions to Avoid: Incompatible materials, light, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents, reducing agents, bases.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 57-10-3: RT4550000

LD50/LC50:

CAS# 57-10-3:

Oral, rat: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 57-10-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Goldfish: LD = 11 mg/L; Unspecified; UnspecifiedFish: Red killifish: LC50 = 150 mg/L; 96 Hr; Unspecified Biodegradation of palmitic acid is a relatively quick process, reaching approximately 37 percent biodegradation after 5 days in the presence of both sewage inoculum and activated sludge. In water, palmitic acid is expected to adsorb to sediment or particulate matter based on its Koc value. This compound is not expected to volatilize from water surfaces given its estimated Henry's Law constant. Bioconcentration in aquatic organisms should be very high based upon an estimated BCF value of 166,000.

Environmental: If released into the atmosphere, palmitic acid is expected to exist solely in the particulate phase in the ambient atmosphere. Any vapor-phase palmitic acid is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals with a half-life of about 20 hours. An estimated Koc value of 189,000 suggests that palmitic acid will be immobile in soil. Volatilization from moist soil is not expected and volatilization from dry soil surfaces should not be important.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 57-10-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 57-10-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 57-10-3: 0

Canada - DSL/NDSL

CAS# 57-10-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

SIGMA CHEMICAL CO -- PAPAIN LYOPHILIZED, P4762 -- 6505-00N093124

=====
===== Product Identification =====

Product ID:PAPAIN LYOPHILIZED, P4762

MSDS Date:01/01/1999

FSC:6505

NIIN:00N093124

Status Code:A

MSDS Number: CJWLC

=== Responsible Party ===

Company Name:SIGMA CHEMICAL CO

Box:14508

City:ST LOUIS

State:MO

ZIP:63178

Country:US

Info Phone Num:314-771-5765

Emergency Phone Num:314-771-5765

CAGE:21076

=== Contractor Identification ===

Company Name:SIGMA CHEMICAL COMPANY

Address:3050 SPRUCE ST

Box:14508

City:ST LOUIS

State:MO

ZIP:63178

Country:US

Phone:314-771-5765

CAGE:21076

=====
===== Composition/Information on Ingredients =====

Ingred Name:PAPAIN

CAS:9001-73-4

RTECS #:RU4950000

= Wt:100.

Other REC Limits:N/K

OSHA PEL:N/K

OSHA STEL:N/K

ACGIH TLV:N/K

ACGIH STEL:N/K

=====
===== Hazards Identification =====

LD50 LC50 Mixture:SEE TOXICOLOGICAL INFORMATION.

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE: MAY BE HARMFUL BY INHALATION,
INGESTION, OR SKIN ABSORPTION. PROLONGED OR REPEATED EXPOSURE MAY
CAUSE ALLERGIC REACTIONS IN CERTAIN SENSITIVE INDIVIDUALS. EXPOSURE
CAN CAUSE ASTHMA, SKIN ERUPTIONS, EMPHYSEMA, ANAPHYLACTIC SHOCK,
AND PROTEOLYTIC ACTION.

Effects of Overexposure:SEE HEALTH HAZARDS.

=====
===== First Aid Measures =====

First Aid:INGESTION: WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN. SKIN: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. CALL A P HYSICIAN. INHALATION: REMOVE TO FRESH AIR. IF BREATHING BECOMES DIFFICULT, CALL A PHYSICIAN. EYES: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. ASSURE ADEQUATE FLUSHING BY SEPARATING T HE EYELIDS WITH FINGERS. CALL A PHYSICIAN.

===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY.

Fire Fighting Procedures:WEAR NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE EQUIPMENT .

===== Accidental Release Measures =====

Spill Release Procedures:WEAR NIOSH APPROVED RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL S ITE AFTER MATERIAL PICKUP IS COMPLETE.

===== Handling and Storage =====

Handling and Storage Precautions:AVOID PROLONGED OR REPEATED EXPOSURE. AVOID BREATHING DUST. KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR APPROPRIATE NIOSH APPROVED RESPIRATOR.

Ventilation:MECHANICAL EXHAUST REQUIRED.

Protective Gloves:CHEMICAL-RESISTANT GLOVES.

Eye Protection:ANSI APPROVED CHEMICAL WORKERS GOGGLES .

Other Protective Equipment:EYEWASH AND DELUGE SHOWER MEETING ANSI DESIGN CRITERIA . PROTECTIVE CLOTHING.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

Solubility in Water:SOLUBLE

Appearance and Odor:TAN COARSE PARTICLES.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

Stability Condition to Avoid:PROTECT FROM LIGHT.

Hazardous Decomposition Products:NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.

===== Toxicological Information =====

Toxicological Information:RTECS # RU4950000, PAPAIN. TOXICITY DATA:
ORL-RAT LD50: >4 GM/KG; AIPTAK 159, 126, 1966. ORL-MUS LD50: 12500
MG/KG; NYKZAU 51, 27, 1955. TARGET ORGAN DATA: GI (CHANGES IN
STRUCTURE/FUNCTION OF ESOPHAG US); EFFECTS ON FERTILITY

(POST-IMPLANTATION MORTALITY); EFFECTS ON EMBRYO/FETUS (FETAL DEATH); SPECIFIC DEVELOPMENTAL ABNORMALITIES (CNS, MUSCULOSKELETAL SYSTEM, HEPATOBILIARY SYSTEM, UROGENITAL SYSTEM, HOMEOSTASIS, OTHER DEVELOPMENTAL ABNORMALITIES); EFFECTS OF NEWBORN (WEANING/LACTATION INDEX). ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE AC TUAL ENTRY IN RTECS FOR COMPLETE INFO.

=====
Ecological Information
=====

Ecological:DATA NOT YET AVAILABLE.

=====
Disposal Considerations
=====

Waste Disposal Methods:DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

=====
MSDS Transport Information
=====

Transport Information:CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

=====
Regulatory Information
=====

Federal Regulatory Information:EUROPEAN INFORMATION: HARMFUL. R 36/37/38: IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN. R 42: MAY CAUSE SENSITIZATION BY INHALATION. S 22: DO NOT BREATHE DUST. S 24: AVOID CONTACT WITH SKIN. S 26:IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE. S 36/37: WEAR SUITABLE PROTECTIVE CLOTHING AND GLOVES. REVIEWS, STANDARDS, AND REGULATIONS: OEL=MAK. NOHS 1974: HZD 80474; NIS 28; TNF 3537; NOS 77; TNE 46199. NOES 1983: HZD 80474; NIS 6; TNF 431; NOS 15; TNE 8042, TFE 3088. EPA TSCA SECTION 8 (B) CHEMICAL INVENTORY.

State Regulatory Information:

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Other Information
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Material Safety Data Sheet

Periodic Acid

ACC# 18298

Section 1 - Chemical Product and Company Identification

MSDS Name: Periodic Acid

Catalog Numbers: A223-100, A223-25, BP580-100, BP580-25, BP581-100, BP581-25

Synonyms: Para-Periodic Acid; P-Periodic Acid; Iodic Acid; Orthoperiodic Acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10450-60-9	Periodic acid	100	233-937-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! Corrosive. Causes eye and skin burns. Strong oxidizer. Contact with other material may cause a fire. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: No data found.

Potential Health Effects

Eye: Causes eye burns. May cause permanent corneal opacification. May cause chemical conjunctivitis and corneal damage.

Skin: Causes skin burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes

gastrointestinal tract burns. May cause perforation of the digestive tract. Causes digestive tract burns with immediate pain, swelling of the throat, convulsions, and possible coma. May cause systemic effects. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. Causes chemical burns to the respiratory tract. Aspiration may lead to pulmonary edema. May cause systemic effects. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Use water with caution and in flooding amounts. Decomposes at high temperatures, resulting in toxic and corrosive products. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Contact professional fire-fighters immediately. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid breathing vapors from heated material. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Discard contaminated shoes.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Heat can cause thermal decomposition and pressure build-up inside containers.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Periodic acid	none listed	none listed	none listed

OSHA Vacated PELs: Periodic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: odorless
pH: Acidic in solution.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Decomposes.
Decomposition Temperature: 122 deg C
Solubility: Soluble in water.
Specific Gravity/Density: 1.4
Molecular Formula: $\text{HIO}_4 \cdot 2\text{H}_2\text{O}$
Molecular Weight: 227.9359

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated.
Conditions to Avoid: Incompatible materials, ignition sources, dust generation, excess heat, combustible materials, organic materials, reducing agents, heating to decomposition.
Incompatibilities with Other Materials: Strong reducing agents, reducing agents, strong bases, dimethyl sulfoxide, finely powdered metals, tetraethylammonium hydroxide.
Hazardous Decomposition Products: Irritating and toxic fumes and gases, hydrogen iodide, iodide ions (I-).
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 10450-60-9 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:

CAS# 10450-60-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found**Teratogenicity:** No information found**Reproductive Effects:** No information found**Mutagenicity:** No information found**Neurotoxicity:** No information found**Other Studies:**

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, CORROSIVE, N.O.S.	No information available.
Hazard Class:	5.1	
UN Number:	UN3085	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL**TSCA**

CAS# 10450-60-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10450-60-9: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10450-60-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

O C

Risk Phrases:

R 34 Causes burns.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 27 Take off immediately all contaminated clothing.

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 10450-60-9: 2

Canada - DSL/NDSL

CAS# 10450-60-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

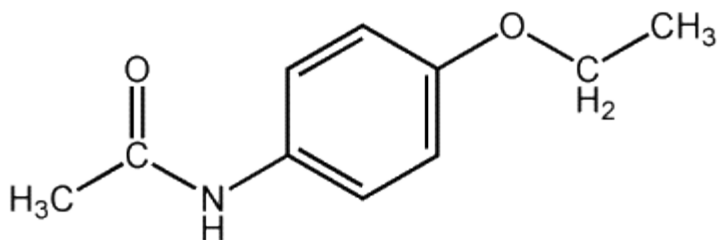
Canadian Ingredient Disclosure List

Phenacetin

- p-Acetophenetidide
- 4'-Ethoxyacetanilide
- 4-Acetophenetidide
- N-(4-Ethoxyphenyl)acetamide

Formula $C_{10}H_{13}NO_2$

Structure



Description Odorless fine white crystalline solid with a lightly bitter taste.

Uses Analgesic.

Registry Numbers and Inventories.

CAS	62-44-2
NIH PubChem CID	4754
EC (EINECS/ELINCS)	200-533-0
RTECS	AM4375000
RTECS class	Tumorigen; Drug; Mutagen; Reproductive Effector; Human Data
Merck	12,7344
Beilstein/Gmelin	1869238
Beilstein Reference	4-13-00-01092
RCRA	U187
Canada DSL/NDSL	DSL
US TSCA	Listed
Austrailia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed
Israel	Listed

Properties.

Formula	C10H13NO2
Formula mass	179.22
Melting point, °C	134-135
Boiling point, °C	355
Vapor pressure, mmHg	260 (185 C)
Density	1.2404
Solubility in water	800 m8 g/L
Refractive index	1.505 (20 C)
Partition coefficient, pK_{ow}	1.58
Heat of fusion	31.3 kJ/mol
Heat of vaporization	60.0 kJ/mol
Heat of combustion	-5455 kJ/mol

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents - strong acids - strong bases.
Decomposition	Nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen.

Fire.

Flash Point, °C	168
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. To extinguish fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Health.

Carcinogen	I-2A, N-2, CP65
Exposure effects	Chronic ingestion may cause effects similar to those of acute ingestion. Chronic exposure may lead to weight loss, shortness of breath, weakness, and often aplastic anemia. Experimental carcinogen.
Ingestion	May cause irritation of the digestive tract. May cause kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Methemoglobinemia is characterized by dizziness, drowsiness, headache, breath shortness, cyanosis with bluish skin, rapid heart rate and chocolate-brown colored blood. May cause sideroblastic anemia and hemolytic anemia. May result in Stevens-Johnson syndrome. Ingestion of large amounts may cause cyanosis, respiratory depression and cardiac arrest.
Inhalation	May cause respiratory tract irritation. May cause methemoglobinemia, cyanosis, convulsions, tachycardia, dyspnea, and death.
Skin	May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May produce mucosal lesions.
Eyes	May cause eye irritation.
First aid	
Ingestion	If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation	Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Skin	Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

USCG CHRIS Code

ATE

Material Safety Data Sheet

Phenyl salicylate

ACC# 18607

Section 1 - Chemical Product and Company Identification

MSDS Name: Phenyl salicylate

Catalog Numbers: AC165080000, AC165080010, AC165080050, AC165082500, S80120, S801201

Synonyms: 2-Hydroxybenzoic acid, phenyl ester; Phenyl 2-hydroxybenzoate; Salol; Salicylic acid, phenyl ester.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
118-55-8	Phenyl salicylate	99	204-259-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! May cause allergic skin reaction. May cause eye, skin, and respiratory tract irritation. May cause adverse reproductive effects based upon animal studies.

Target Organs: Skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Two cases in NIOSHTIC found allergic skin reactions to phenyl salicylate (also known as salol). One case involved a hairdresser

developing a violent eczematous reaction after a single application of a hand cream containing phenyl salicylate. Testing results on the hairdresser indicated strong positive reactions with the product and with salol, but not with the other ingredients. The intensity of the subject's reaction was indicated to be due to the high concentration of salol (10%) in the product. The authors conclude that sensitization to salol in this case is due to the protracted past use of sunscreens. The other case found dermatitis from phenyl salicylate in safety spectacle frames. The phenyl salicylate is an UV light absorber added to plastics to prevent deterioration by sunlight. Three cases of allergic contact dermatitis behind the ears resulting from wearing a specific brand of industrial safety spectacles were reported.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

Chronic: Adverse reproductive effects have been reported in animals. Prolonged and/or repeated skin exposure may cause allergic dermatitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: > 110 deg C (> 230.00 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Phenyl salicylate	none listed	none listed	none listed

OSHA Vacated PELs: Phenyl salicylate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder
Appearance: white
Odor: pleasant odor - aromatic odor
pH: Not available.
Vapor Pressure: < .1 mm Hg @ 20 deg C
Vapor Density: 7.4
Evaporation Rate:Not applicable.
Viscosity: Not available.
Boiling Point: 172-173 deg C @ 12 mm Hg
Freezing/Melting Point:40-44 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble.
Specific Gravity/Density:1.25
Molecular Formula:C13H10O3
Molecular Weight:214.22

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Light sensitive.

Conditions to Avoid: Dust generation, excess heat, excess light.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, strong bases.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 118-55-8: VO6125000

LD50/LC50:

CAS# 118-55-8:

Oral, rat: LD50 = 3 gm/kg;

Carcinogenicity:

CAS# 118-55-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 118-55-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 118-55-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 43 May cause sensitization by skin contact.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 118-55-8: No information available.

Canada - DSL/NDSL

CAS# 118-55-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Phenylhydrazine hydrochloride, 99+%

ACC# 73123

Section 1 - Chemical Product and Company Identification

MSDS Name: Phenylhydrazine hydrochloride, 99+%

Catalog Numbers: AC151550000, AC151550050, AC151551000, AC151555000

Synonyms: Hydrazine, phenyl-, hydrochloride; Hydrazine, phenyl-, monohydrochloride; Phenylhydrazine monohydrochloride; Phenylhydrazin hydrochlorid; Phenylhydrazinium chloride

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
59-88-1	Phenylhydrazine hydrochloride	99+	200-444-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to cream powder.

Warning! Harmful if swallowed, inhaled, or absorbed through the skin. Possible risks of irreversible effects. Causes respiratory tract irritation. May cause allergic skin reaction. Causes eye and skin irritation. May cause blood abnormalities. May cause liver and kidney damage. Light sensitive. Air sensitive. Dangerous for the environment.

Target Organs: Blood, kidneys, liver, lungs, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. Harmful if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause eczematous dermatitis with swelling and vesiculation.

Ingestion: Harmful if swallowed. May cause liver and kidney damage. Causes gastrointestinal tract irritation. May cause systemic effects by ingestion: blood hemolysis

with or without anemia, methemoglobinemia-carboxyhemoglobinemia, and pulmonary changes. May cause central nervous system stimulation.

Inhalation: Harmful if inhaled. Causes respiratory tract irritation. May cause effects similar to those described for ingestion. Acute exposure to low concentrations of hydrazines may cause and produce bronchial mucous destruction, pulmonary edema, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood) and possible death.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis. May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. May cause fetal effects. May cause cancer according to animal studies. Laboratory experiments have resulted in mutagenic effects. Chronic inhalation may cause liver damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood. Monitor arterial blood gases, chest x-ray, pulmonary function tests if respiratory tract irritation or respiratory depression is evident. Monitor methemoglobin and blood sugar levels.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Use carbon dioxide, dry chemical, or water fog.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Place under an inert atmosphere.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Store protected from light. Handle under an inert atmosphere. Store protected from air. Use only in a chemical fume hood.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from light. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Phenylhydrazine hydrochloride	none listed	none listed	none listed

OSHA Vacated PELs: Phenylhydrazine hydrochloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white to cream

Odor: weak aromatic odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 250-154 deg C

Decomposition Temperature: > 245 deg C

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₈N₂.HCl

Molecular Weight: 144.61

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. May violently decompose at temperatures above 190°C.

Conditions to Avoid: Incompatible materials, light, dust generation, exposure to air, temperatures above 90°C.

Incompatibilities with Other Materials: Air, strong oxidizing agents, lead dioxide, common metals (except aluminum), bases.

Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 59-88-1: MV9000000

LD50/LC50:

CAS# 59-88-1:

Oral, mouse: LD50 = 2100 mg/kg;

CAS# 100-63-0: Oral, rat: LD50 = 188 mg/kg.; Inhalation, rat: LC50 = 2610 mg/m³. (The toxicity of this product is partially based on the hazards associated with Phenylhydrazine (CAS# 100-63-0).

Carcinogenicity:

CAS# 59-88-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found**Teratogenicity:** Intraperitoneal, rat: TDLo = 30 mg/kg (female 17-19 day(s) after conception) Effects on Newborn - behavioral.**Reproductive Effects:** No information found**Mutagenicity:** Oral, mouse: TDLo = 8000 mg/kg/42W-I (Tumorigenic - neoplastic by RTECS criteria--Lungs, Thorax, or Respiration - Tumors); Oral, mouse: TD = 10 gm/kg/58W-C (Tumorigenic - neoplastic by RTECS criteria--Vascular - Tumors and Blood - Lymphoma, including Hodgkin's disease); Mutation in microorganisms: Salmonella typhimurium = 800 ug/plate; DNA repair: Rat, liver = 10 umol/L.**Neurotoxicity:** No information found**Other Studies:**

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.**Environmental:** The environmental hazards of phenylhydrazine may be seen in this product.**Physical:** No information available.**Other:** No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLID ORGANIC NOS (PHENYLHYDRAZINE HYDROCHLORIDE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 59-88-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

CAS# 59-88-1: 1000 lb TPQ (lower threshold); 10000 lb TPQ (upper threshold)

SARA Codes

CAS # 59-88-1: immediate, delayed, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 59-88-1 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: CAS# 59-88-1: 1.4 µg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 36/38 Irritating to eyes and skin.
R 43 May cause sensitization by skin contact.
R 45 May cause cancer.
R 50 Very toxic to aquatic organisms.
R 48/23/24/25 Toxic : danger of serious damage to health by prolonged exposure through inhalation, contact with skin and if swallowed.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 59-88-1: 3

Canada - DSL/NDSL

CAS# 59-88-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Phosphomolybdic acid hydrate

ACC# 18685

Section 1 - Chemical Product and Company Identification

MSDS Name: Phosphomolybdic acid hydrate

Catalog Numbers: AC417890000, AC417890050, AC417890250, 41789-1000, A237-100

Synonyms: Molybdophosphoric acid hydrate (H₃PMo₁₂O₄₀.xH₂O);

Dodecamolybdophosphoric acid hydrate; Phosphomolybdic acid hydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
51429-74-4	Phosphomolybdic acid hydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: bright yellow crystals.

Danger! Strong oxidizer in aqueous solution. Solution may ignite combustible materials. May cause severe eye and skin irritation with possible burns. May cause severe respiratory and digestive tract irritation with possible burns. Corrosive to metal. Refrigerate upon arrival below 4°C/39°F.

Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Eye: Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or

moist. May be harmful if absorbed through the skin.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.

Inhalation: May cause burns to the respiratory tract. May be harmful if inhaled.

Chronic: Aerosols of water-soluble molybdenum compounds can affect the respiratory tract if inhaled. Animal data from chronic inhalation studies have shown inflammatory changes in the lungs of rats, with cellular aggregates resembling nodules, which are consistent with some of the earlier clinical reports of lung problems among exposed workers. Data from a NTP study indicate that molybdenum trioxide, a soluble compound, is a likely animal carcinogen.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. Strong oxidizer in aqueous solution. Solution may ignite combustible materials.

Extinguishing Media: Dry chemical; carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material. Do not use metal tools.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Keep from contact with clothing and other combustible materials. Discard contaminated shoes. Use only with adequate ventilation. Do not use with metal spatula or other metal items.

Storage: Store in a cool, dry place. Do not store in metal containers. Keep containers tightly closed. Refrigerate upon arrival below 4°C/39°F.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Phosphomolybdic acid hydrate	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).
Phosphomolybdic acid, anhydrous	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).

OSHA Vacated PELs: Phosphomolybdic acid hydrate: No OSHA Vacated PELs are listed for this chemical. Phosphomolybdic acid, anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and

ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: bright yellow
Odor: none reported
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 78 - 90 deg C
Decomposition Temperature: 500 deg C
Solubility: Soluble.
Specific Gravity/Density: 3.15 g/cc
Molecular Formula: H₃Mo₁₂O₄₀P.XH₂O
Molecular Weight: 1825.25+18.02

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation, moisture, excess heat.
Incompatibilities with Other Materials: Metals, strong reducing agents, strong bases, finely powdered metals, organic materials.
Hazardous Decomposition Products: Oxides of phosphorus, oxides of molybdenum.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 51429-74-4 unlisted.
CAS# 12026-57-2 unlisted.
LD50/LC50:
Not available.
Not available.

Carcinogenicity:
CAS# 51429-74-4:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 12026-57-2:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, CORROSIVE, N.O.S.	OXIDIZING SOLID, CORROSIVE, N.O.S.
Hazard Class:	5.1	5.1
UN Number:	UN3085	UN3085
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 51429-74-4 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 12026-57-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 51429-74-4: immediate, delayed, fire.

CAS # 12026-57-2: immediate, delayed, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 51429-74-4 can be found on the following state right to know lists: California, (listed as Molybdenum compounds, n.o.s.), Minnesota, (listed as Molybdenum soluble compounds).

CAS# 12026-57-2 can be found on the following state right to know lists: California, (listed as Molybdenum compounds, n.o.s.), Minnesota, (listed as Molybdenum soluble compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:

O C

Risk Phrases:

R 34 Causes burns.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 25 Avoid contact with eyes.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 51429-74-4: No information available.

CAS# 12026-57-2: No information available.

Canada - DSL/NDSL

CAS# 12026-57-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, E, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 51429-74-4 (listed as Molybdenum compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 12026-57-2 (listed as Molybdenum compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Phosphotungstic Acid Hydrate

ACC# 01208

Section 1 - Chemical Product and Company Identification

MSDS Name: Phosphotungstic Acid Hydrate

Catalog Numbers: AC208310000, AC208310250, AC208311000, AC208315000

Synonyms: Tungstophosphoric acid hydrate; Dodeca-Tungstophosphoric acid hydrate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12501-23-4	Phosphotungstic acid hydrate	99-100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to cream crystals.

Danger! Causes burns by all exposure routes.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns. Contact may cause ulceration of the conjunctiva and cornea.

Skin: Causes skin burns. May be harmful if absorbed through the skin.

Ingestion: Causes gastrointestinal tract burns. Causes severe pain, nausea, vomiting, diarrhea, and shock. May be harmful if swallowed.

Inhalation: Causes chemical burns to the respiratory tract. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from heat and flame. Keep container closed when not in use. Corrosives area. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Phosphotungstic acid hydrate	5 mg/m ³ TWA (as W) (listed under Tungsten, insoluble compounds). 10 mg/m ³ STEL (as W) (listed under Tungsten, insoluble compounds).	5 mg/m ³ TWA (as W) (listed under Tungsten, insoluble compounds). 1 mg/m ³ TWA (as W) (listed under Tungsten, soluble compounds).	none listed

OSHA Vacated PELs: Phosphotungstic acid hydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white to cream

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 0 deg C

Decomposition Temperature: Not available.

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: H₃PO₄·12H₂O

Molecular Weight: 2880.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, dust generation.

Incompatibilities with Other Materials: Strong bases, strong oxidizing agents.

Hazardous Decomposition Products: Phosphine, carbon monoxide, oxides of phosphorus, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 12501-23-4 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 12501-23-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste

regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O. Phosphotungstic acid hydrate	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.
Hazard Class:	8	8
UN Number:	UN3260	UN3260
Packing Group:	III	III
Additional Info:		Phosphotungstic acid hydrate

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12501-23-4 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the

CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12501-23-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 34 Causes burns.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 12501-23-4: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 12501-23-4 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Phthalic anhydride, p.a.

ACC# 10535

Section 1 - Chemical Product and Company Identification

MSDS Name: Phthalic anhydride, p.a.

Catalog Numbers: AC220880000, AC220881000, AC220885000

Synonyms: 1,3-Isobenzofuranidone

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
85-44-9	Phthalic anhydride	99.0	201-607-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! Corrosive. Causes eye and skin burns. Causes digestive and respiratory tract burns. May cause allergic skin reaction. Moisture sensitive.

Target Organs: Skin.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause severe irritation and possible burns.

Ingestion: Causes gastrointestinal tract burns.

Inhalation: May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Destroy contaminated shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: 152 deg C (305.60 deg F)

Autoignition Temperature: 580 deg C (1,076.00 deg F)

Explosion Limits, Lower: 1.70 vol %

Upper: 10.50 vol %

NFPA Rating: 2 - health, 1 - flammability, 0 - instability

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Phthalic anhydride	1 ppm TWA	1 ppm TWA; 6 mg/m ³ TWA 60 mg/m ³ IDLH	2 ppm TWA; 12 mg/m ³ TWA

OSHA Vacated PELs: Phthalic anhydride: 1 ppm TWA; 6 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear safety glasses and chemical goggles if splashing is possible.

Skin: Wear appropriate protective gloves and clothing to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: 0.01 mbar @ 20

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: 0.64 cP 97 deg C

Boiling Point: 284 deg C @ 760.00mm Hg

Freezing/Melting Point: 131 - 133 deg C

Decomposition Temperature: Not available.

Solubility: 6 G/L (20°C)

Specific Gravity/Density: 1.5300g/cm³

Molecular Formula: C₈H₄O₃

Molecular Weight: 148.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Not available.

Incompatibilities with Other Materials: Strong acids - strong bases - strong oxidizing agents - strong reducing agents - moisture.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 85-44-9: TI3150000

LD50/LC50:

CAS# 85-44-9:

Draize test, rabbit, eye: 50 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = >210 mg/m³/1H;

Oral, mouse: LD50 = 1500 mg/kg;

Oral, rat: LD50 = 1530 mg/kg;

Skin, rabbit: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 85-44-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 85-44-9: waste number U190.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	PHTHALIC ANHYDRIDE	PHTHALIC ANHYDRIDE
Hazard Class:	8	8
UN Number:	UN2214	UN2214
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 85-44-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 85-44-9: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 85-44-9: immediate, delayed, reactive.

Section 313

This material contains Phthalic anhydride (CAS# 85-44-9, 99.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 85-44-9 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 85-44-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 85-44-9: 0

Canada - DSL/NDSL

CAS# 85-44-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 85-44-9 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

3-Nitrobenzoic acid, 99%

p-Nitrobenzoic acid, 99%

ACC# 26539

Section 1 - Chemical Product and Company Identification

MSDS Name: 3-Nitrobenzoic acid, 99%

Catalog Numbers: AC180700000, AC180700050, AC180701000, AC180705000

Synonyms: Benzoic Acid,3-nitro-(9CI); M-nitrobenzenecarboxylic Acid; M-nitrobenzoic acid; 3-nitrobenzoic acid

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
121-92-6	3-Nitrobenzoic acid	99	204-508-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: pale yellow.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause digestive tract disturbances. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
3-Nitrobenzoic acid	none listed	none listed	none listed

OSHA Vacated PELs: 3-Nitrobenzoic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: pale yellow

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 5.76

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 142 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 1.494
Molecular Formula: C₇H₅NO₄
Molecular Weight: 167.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials: Oxidizing agents.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 121-92-6: DH5000000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 121-92-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 121-92-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 121-92-6: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 121-92-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 33 Danger of cumulative effects.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 121-92-6: 1

Canada - DSL/NDSL

CAS# 121-92-6 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Potassium metabisulfite

ACC# 01302

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium metabisulfite

Catalog Numbers: AC418270000, AC418270250, AC418275000

Synonyms: Potassium Pyrosulfate; Dipotassium Disulfate; Pyrosulfurous Acid, Dipotassium Salt; Disulfurous Acid, Dipotassium Salt

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
16731-55-8	Potassium metabisulfite	100	240-795-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: very slightly yellow crystalline powder.

Warning! Eye contact may result in permanent eye damage. May cause allergic respiratory reaction. Causes eye and respiratory tract irritation. Contact with acids liberates toxic gas. May cause skin irritation. Ingestion may result in an allergic reaction.

Target Organs: Respiratory system, eyes.

Potential Health Effects

Eye: Causes redness and pain. Causes severe burning pain and redness of the conjunctiva. Risk of serious damage to eyes.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause reddening of the skin.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. May cause worsening of asthma in asthmatics. Individuals sensitive to sulfides may experience stomach upset, tightness in the chest, or

Inhalation: Causes respiratory tract irritation. May cause asthmatic attacks due to allergic

sensitization of the respiratory tract.

Chronic: Repeated or prolonged exposure may cause allergic reactions in sensitive individuals.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep away from acids. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium metabisulfite	none listed	none listed	none listed

OSHA Vacated PELs: Potassium metabisulfite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white - very slightly yellow

Odor: faint odor - sulfur dioxide odor

pH: 3.5-4.5 @ 5% aq. soln.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 190 deg C

Decomposition Temperature: Not available.

Solubility: Appreciable solubility in water.

Specific Gravity/Density: Not available.

Molecular Formula: K₂S₂O₅

Molecular Weight: 222.3136

Section 10 - Stability and Reactivity

Chemical Stability: Contact with acids liberates toxic gas, Sulfur oxides.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong acids, water, metals, nitrates.

Hazardous Decomposition Products: Oxides of potassium, sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 16731-55-8: TT4920000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 16731-55-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: According to IARC, there is inadequate evidence for the carcinogenicity in humans of metabisulfites.

Teratogenicity: No data available.

Reproductive Effects: In laboratory studies, potassium metabisulfite has caused reduced weight gain in newborn rats. TDLo = 35 gm/kg.

Mutagenicity: In experimental systems, potassium metabisulfite has been observed to cause unscheduled DNA synthesis in rats when administered orally at a dose of 400 mg/kg.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 16731-55-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 16731-55-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 16731-55-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 31 Contact with acids liberates toxic gas.

R 37 Irritating to respiratory system.

R 41 Risk of serious damage to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

S 50A Do not mix with acids.

WGK (Water Danger/Protection)

CAS# 16731-55-8: 1

Canada - DSL/NDSL

CAS# 16731-55-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 16731-55-8 is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- P201500, POTASSIUM BITARTRATE P-201 -- 6505-00N031397

=====
===== Product Identification =====

Product ID:P201500, POTASSIUM BITARTRATE P-201

MSDS Date:04/25/1985

FSC:6505

NIIN:00N031397

MSDS Number: BPLHW

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:1 REAGENT LANE

City:FAIR LAWN

State:NJ

ZIP:07410-2802

Country:US

Info Phone Num:201-796-7100

Emergency Phone Num:201-796-7100

CAGE:1B464

=== Contractor Identification ===

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV

Address:1 REAGENT LANE

Box:City:FAIRLAWN

State:NJ

ZIP:07410-2802

Country:US

Phone:201-796-7100

CAGE:1B464

=====
===== Composition/Information on Ingredients =====

Ingred Name:TARTARIC ACID, MONOPOTASSIUM SALT; (POTASSIUM BITARTRATE)

CAS:868-14-4

RTECS #:WW8223000

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.

Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE/CHRONIC:INHAL:NO DATA AVAILABLE.

SKIN: NONE KNOWN IN HUMANS. EYE:MAY CAUSE IRRITATION . INGEST:NO

EFFECTS HAVE BEEN REPORTED IN HUMANS.

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:SEE HEALTH HAZARDS.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INHAL:REMOVE FROM EXPOS AREA TO FRESH AIR IMMED. IF BRTHG HAS STOPPED, GIVE ARTIF RESP. KEEP AFFECTED PERSON WARM & AT REST. GET MD ATTN. SKIN:REMOVE CONTAM CLTHG & SHOES. WASH AFFECTED AREA W/SOAP/MI LD DETERGENT & LRG AMTS OF WATER UNTIL NO EVIDENCE OF CHEM REMAINS (APPROX 10-20 MIN). GET MD ATTN IF NEEDED. EYE:WASH IMMED W/LRG AMTS OF WATER, OCCAS LIFTING UPPER & LOWER LIDS, UNTIL NO (SUPDAT)

=====
===== Fire Fighting Measures =====

Flash Point:NON-FLAMMABLE
Extinguishing Media:DRY CHEM, CO2, WATER SPRAY/ALCOHOL FOAM. FOR LRG FIRES USE WATER SPRAY, FOG/ALCOHOL FOAM.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT . NO ACUTE HAZARD. MOVE CONTR FROM FIRE AREA IF POSS. AVOID BRTHG VAP/DUST; KEEP UPWIND.
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE AND EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME.

=====
===== Accidental Release Measures =====

Spill Release Procedures:NO SPECIAL PRECAUTIONS INDICATED.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:AVOID REPEATED OR PROLONGED CONTACT WITH THIS SUBSTANCE.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:AT HIGH LEVELS USE NIOSH/MSHA APPROVED DUST MASK.
Ventilation:PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION SYSTEM.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEM WORK GOGG/FULL LENGTH FCSHLD
Other Protective Equipment:WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, EMPLOYER SHALL PROVIDE (SUPDAT)
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
FIRST AID PROC:EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MD ATTN. INGEST:IF VICTIM IS CONSCIOUS, IMMED GIVE 2-4 GLASSES OF WATER. INDUCE VOMIT BY TOUCHING FINGER TO BACK OF THROAT. GET MD ATTEN IMMED. DO NOT INDUCE VOMIT. GET IMMED MEDICAL ATTN. OTHER PROT EQUIP:AN EYE-WASH FOUNTAIN WITHIN WORK AREA FOR EMERG.

=====
===== Physical/Chemical Properties =====

HCC:N1
Spec Gravity:2.0 @ 64F
Solubility in Water:0.4% @ 50F
Appearance and Odor:COLORLESS CRYSTALS/WHITE, CRYSTALLINE POWDER W/ PLEASANT ACIDULOUS TASTE

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NONE KNOWN
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:BY COMBUST MAY YIELD:CO, CO2. THIS GASEOUS MIX IS TOX & REACTIVE. A CAUSTIC POTASH RESIDUE WOULD ALSO BE FORMED.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE WITH LOCAL, STATE
AND FEDERAL REGULATIONS .

Disclaimer (provided with this information by the compiling agencies):
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particular situation.

Material Safety Data Sheet

Potassium Bromate

ACC# 19270

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium Bromate

Catalog Numbers: S80133, P207-250, P207-500

Synonyms: Bromic Acid, Potassium Salt

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7758-01-2	Potassium bromate	100	231-829-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Oxidizer. Harmful if swallowed. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. May cause cancer based on animal studies. May cause central nervous system depression. May cause liver and kidney damage.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: Causes moderate eye irritation. May cause transient corneal injury.

Skin: May cause skin irritation. In the presence of moisture, this material may be absorbed through the skin.

Ingestion: Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause central nervous system

depression. Hearing loss and deafness have been reported.

Inhalation: May cause respiratory tract irritation. May cause abdominal pain, nausea, vomiting, and inflammation of the gums and mouth.

Chronic: May cause liver and kidney damage. May cause cancer according to animal studies.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Administration of Sodium bicarbonate may be of value to treat acidosis.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Oxidizer. Greatly increases the burning rate of combustible materials. Some oxidizers may react explosively with hydrocarbons(fuel). Containers may explode if exposed to fire.

Extinguishing Media: Use flooding quantities of water as spray. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 2; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Wash area with soap and water. Clean up spills immediately, observing

precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with skin and eyes. Keep container tightly closed. Do not ingest or inhale.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium bromate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium bromate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate clothing to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 7

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 350 deg C

Decomposition Temperature: 370 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 3.2700

Molecular Formula: KBrO₃

Molecular Weight: 167.0005

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat.

Incompatibilities with Other Materials: Strong reducing agents; finely powdered metals; sulfur; arsenic; metal sulfides; organic matter; phosphorus

Hazardous Decomposition Products: Hydrogen bromide, oxygen, oxides of potassium.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7758-01-2: EF8725000

LD50/LC50:

CAS# 7758-01-2:

Oral, mouse: LD50 = 289 mg/kg;

Oral, rat: LD50 = 157 mg/kg; <BR.

Carcinogenicity:

CAS# 7758-01-2:

- **California:** carcinogen, initial date 1/1/90
- **IARC:** Group 2B carcinogen

Epidemiology: 8There is sufficient evidence for the carcinogenicity of potassium bromate in experimental animals. (IARC, Vol 40, 1986)

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: Animal tests have shown positive results for the mutagenicity of potassium

bromate. (RTECS)

Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	POTASSIUM BROMATE	No information available.
Hazard Class:	5.1	
UN Number:	UN1484	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-01-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7758-01-2: acute, chronic, flammable.

Section 313

This material contains Potassium bromate (CAS# 7758-01-2, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7758-01-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Potassium bromate, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 7758-01-2: 1 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T O

Risk Phrases:

R 25 Toxic if swallowed.

R 45 May cause cancer.

R 9 Explosive when mixed with combustible material.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 7758-01-2: No information available.

Canada - DSL/NDSL

CAS# 7758-01-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D1A, D2A.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Potassium chromate

ACC# 19320

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium chromate

Catalog Numbers: AC202340000, AC202340050, AC202345000, P220-100, P220-3, P220-500, S71231

Synonyms: Chromic acid, dipotassium salt; Chromate of potassium; Neutral potassium chromate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7789-00-6	Chromic acid dipotassium salt	>99.5	232-140-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. May cause allergic skin reaction. Cancer hazard. May be harmful if absorbed through the skin.

Target Organs: Kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-

exposure to this material. Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause dermatitis.

Ingestion: May cause severe and permanent damage to the digestive tract. May cause liver and kidney damage. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea.

Inhalation: May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation. Causes chemical burns to the respiratory tract. May cause chemical bronchitis with coughing and difficulty in breathing.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Prolonged or repeated exposure may lead to asthma and perforation of the nasal septum. Repeated inhalation may cause chronic bronchitis. May cause liver and kidney damage. May cause cancer in humans.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Containers may explode in the heat of a fire. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Do NOT use dry chemicals, CO₂, Halon or foams. Use water only in flooding quantities as fog.

Flash Point: Not available.

Autoignition Temperature: None reported.

Explosion Limits, Lower: None reported.

Upper: None reported.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Use with adequate ventilation. Discard contaminated shoes.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromic acid dipotassium salt	0.05 mg/m ³ TWA (as Cr) (listed under Chromium (VI) compounds- water soluble).	0.001 mg/m ³ TWA (as Cr) (listed under Chromates). 15 mg/m ³ IDLH (as Cr(VI)) (listed under Chromates).	5 æg/m ³ TWA (listed under Chromium (VI) compounds). 0.1 mg/m ³ Ceiling (as CrO ₃ , applies to any operations or sectors for which the H exavalent Chromium standard [29 CFR 1910.1026] is stayed or is otherwise not in effect) (listed under Chromates). 2.5 æg/m ³ Action Level (as Cr.); 5 æg/m ³ TWA (as Cr, Cancer hazard - see 29

			CFR 1910.1026) (listed under Chromium (VI) compounds).
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OSHA Vacated PELs: Chromic acid dipotassium salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow

Odor: odorless

pH: 8.6-9.8 (5% soln)

Vapor Pressure: 0

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: 975 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 2.7320

Molecular Formula: K₂CrO₄

Molecular Weight: 194.20

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Hydrazine, combustible, organic, or other readily oxidizable materials: paper, wood, sulfur, aluminum, plastics, chromic acid, chromates.

Hazardous Decomposition Products: Oxides of potassium, toxic chromium oxide fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:**CAS#** 7789-00-6: GB2940000**LD50/LC50:**

CAS# 7789-00-6:

Oral, mouse: LD50 = 180 mg/kg;

Carcinogenicity:

CAS# 7789-00-6:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Chromium (VI) compounds-water soluble').
- **California:** carcinogen, initial date 2/27/87 (listed as Chromium (VI) compounds).
- **NTP:** Known carcinogen (listed as Chromium (VI) compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion.

Teratogenicity: TDLo (Intraperitoneal, mouse) = 30 mg/kg

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms (Salmonella typhimurium) = 35 ug/plate
Mutation in microorganisms (Salmonella typhimurium) = 10 ug/plate

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. LC50 Physa heterostropha (snail) 31,600 ug/l as chromium; water hardness as 171 mg/l as calcium carbonate; static unmeasured method LC50 Daphnia magna (Cladoceran) 137,66.7 and 15.3 ug/l as chromium; water hardnesses of 212,188 and 50 as calcium carbonate, respectively, and with pH values of 8.2 to 8.4, 7.5 to 7.5 to 7.6, and 7.5, respectively; static measured method.

Environmental: Aquatic Fate: Cr(VI) exists in solution as hydrochromate, chromate, and dichromate ionic species. The proportion of each ion in solution is dependent on pH. In strongly basic and neutral pHs, the chromate form predominates. Chromium is present usually as Cr(III) in the soil and is characterized by its lack of mobility, except in cases where Cr(VI) is involved. Chromium (VI) of natural origin is rarely found.

Physical: As the pH is lowered, the hydrochromate concentration increases. At very low pHs, the dichromate species predominates. In the pH ranges encountered in natural water, the predominant forms are hydrochromate ions (63.6%) at pH 6.0 to 6.2 and chromate ion

(95.7%) at pH 7.8 to 8.5. The oxidizing ability of Cr(VI) in aqueous solution is pH dependent.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, TOXIC, N.O.S.	Oxidizing Solid, Toxic, N.O.S. (POTASSIUM CHROMATE)
Hazard Class:	5.1	5.1
UN Number:	UN3087	UN3087
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7789-00-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 7789-00-6: Section 6, 0.1 % de minimus concentration [see 40 CFR 749.68]

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7789-00-6: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7789-00-6: immediate, delayed.

Section 313

This material contains Chromic acid dipotassium salt (listed as Chromium (VI) compounds), >99.5%, (CAS# 7789-00-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7789-00-6 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7789-00-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Chromium (VI) compounds- water soluble), Minnesota, (listed as Chromium (VI) compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chromic acid dipotassium salt, listed as 'Chromium (VI) compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T O N

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 43 May cause sensitization by skin contact.

R 46 May cause heritable genetic damage.

R 8 Contact with combustible material may cause fire.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7789-00-6: 2

Canada - DSL/NDSL

CAS# 7789-00-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2A, D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7789-00-6 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium dichromate

ACC# 19370

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium dichromate

Catalog Numbers: AC196590000, AC196590020, AC196590500, AC196595000, AC197760000, AC197760010, AC197765000, AC325590000, AC424110000, AC424110050, AC424110500, AC424115000, AC9521839, AC9654808, S77435, S77435-1, S77435-2, S93333, P186-3, P186-500, P188-100, P188-3, P188-30, P188-500

Synonyms: Dichromic acid, dipotassium salt; Dipotassium dichromate; Potassium bichromate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-50-9	Chromic acid, dipotassium salt	100	231-906-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange crystalline powder.

Danger! Danger of serious damage to health by prolonged exposure through inhalation. May be fatal if inhaled or swallowed. Strong oxidizer. Contact with other material may cause a fire. Causes burns by all exposure routes. May cause allergic respiratory and skin reaction. May impair fertility. May cause harm to the unborn child. Harmful if absorbed through the skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause heritable genetic damage. May cause sensitization by inhalation and by skin contact.

Target Organs: Blood, kidneys, liver, lungs, respiratory system, gastrointestinal system,

teeth, eyes, skin.

Potential Health Effects

Eye: Causes eye burns.

Skin: Harmful if absorbed through the skin. Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: May be fatal if swallowed. Causes gastrointestinal tract burns. May cause kidney damage. May cause perforation of the digestive tract.

Inhalation: May be fatal if inhaled. May cause allergic respiratory reaction. May cause liver and kidney damage. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause respiratory tract cancer. May cause liver and kidney damage. May cause cancer in humans. Laboratory experiments have resulted in mutagenic effects. Possible risk of harm to the unborn child. Repeated or prolonged exposure may cause erosion and discoloration of the teeth. May impair fertility.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Call a poison control center.

Inhalation: If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Containers may explode if exposed to fire.

Extinguishing Media: Use water only! Do NOT use dry chemical. Do NOT use halocarbons and sodium bicarbonate. Do NOT use carbon dioxide or dry chemical. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 4; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Carefully scoop up and place into appropriate disposal container. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Use only in a chemical fume hood. Discard contaminated shoes.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromic acid, dipotassium salt	0.05 mg/m ³ TWA (as Cr) (listed under Chromium (VI) compounds- water soluble).	0.001 mg/m ³ TWA (as Cr) (listed under Chromates).15 mg/m ³ IDLH (as Cr(VI)) (listed under Chromates).	5 æg/m ³ TWA (listed under Chromium (VI) compounds).0.1 mg/m ³ Ceiling (as CrO ₃ , applies to any operations or sectors for which the H exavalent Chromium

			standard [29 CFR 1910.1026] is stayed or is otherwise not in effect) (listed under Chromates).2.5 æg/m3 Action Level (as Cr.); 5 æg/m3 TWA (as Cr. Cancer hazard - See 29 CFR 1910.1026) (listed under Chromium (VI) compounds).
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OSHA Vacated PELs: Chromic acid, dipotassium salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: orange

Odor: odorless

pH: 4 (5% aq. solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 500 deg C

Freezing/Melting Point:398 deg C

Decomposition Temperature:500 deg C

Solubility: 125 g/L (20°C)

Specific Gravity/Density:2.676

Molecular Formula:K₂Cr₂O₇

Molecular Weight:294.18

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, combustible materials, organic materials.

Incompatibilities with Other Materials: Reducing agents, acids, strong bases, acetic anhydride, hydrazine, hydroxylamine, nitric acid, oils, hydrochloric acid.

Hazardous Decomposition Products: Oxygen, oxides of potassium, chromium dioxide, toxic chromium oxide fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-50-9: HX7680000

LD50/LC50:

CAS# 7778-50-9:

Draize test, rabbit, eye: 140 mg Severe;

Oral, mouse: LD50 = 190 mg/kg;

Oral, rat: LD50 = 25 mg/kg;

Skin, rabbit: LD50 = 14 mg/kg;

Inhalation LC50 (rat): 0.094 mg/l/4H (Merck).

Carcinogenicity:

CAS# 7778-50-9:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Chromium (VI) compounds-water soluble').
- **California:** carcinogen, initial date 2/27/87 (listed as Chromium (VI) compounds).
- **NTP:** Known carcinogen (listed as Chromium (VI) compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals.

Teratogenicity: Oral, rat: TDLo = 1 gm/kg (female 0-19 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system.; Oral, mouse: TDLo = 1 gm/kg (female 20 day(s) pre-mating) Effects on Embryo or Fetus - extra-embryonic structures (e.g., placenta, umbilical cord) and Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).

Reproductive Effects: Oral, rat: TDLo = 525 mg/kg (female 21 day(s) after conception) Fertility - pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea) and Fertility - post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).

Mutagenicity: Micronucleus Test: Human, Lymphocyte = 300 ug/L.; Morphological Transformation: Human, Fibroblast = 200 nmol/L.; DNA Damage: Human, Fibroblast = 500 nmol/L.; Unscheduled DNA Synthesis: Human, Fibroblast = 50 umol/L.; DNA Inhibition: Human, Fibroblast = 100 umol/L.; DNA Inhibition: Human, HeLa cell = 13 umol/L.; Mutation Test Systems - not otherwise specified: Human, Fibroblast = 100 umol/L.

Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Striped bass: LC50 = 75 mg/L; 96 Hr; Static bioassay
Fish: Fathead Minnow: LC50 = 17,300 ug/L; Unspecified; as chromium (Unspecified)
Fish: Bluegill/Sunfish: LC50 = 118,000-133,000 ug/L; Unspecified; as chromium (Static unmeasured)
Water flea Daphnia: EC50 = 1,570 ug/L; 24 Hr; as chromium (Unspecified)
Chromium probably occurs as the insoluble Cr(III) oxide ($\text{Cr}_2\text{O}_3 \cdot n\text{H}_2\text{O}$) in soil, as the organic matter in soil is expected to reduce any soluble chromate to insoluble chromic oxide (Cr_2O_3). Chromium in soil can be transported to the atmosphere by way of aerosol formation. Chromium is also transported from soil through runoff and leaching of water.

Environmental: Most of the chromium in surface waters may be present in particulate form as sediment. Some of the particulate chromium would remain as suspended matter and ultimately be deposited in sediments. Chromium is present usually as Cr(III) in the soil and is characterized by its lack of mobility, except in cases where Cr(VI) is involved. Chromium(VI) of natural origin is rarely found.

Physical: No information available.

Other: Dangerous to aquatic life in high concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, OXIDIZING, N.O.S.	TOXIC SOLIDS, OXIDIZING, N.O.S.
Hazard Class:	6.1	6.1
UN Number:	UN3086	UN3086
Packing Group:	I	I

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-50-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 7778-50-9: Section 6, 0.1 % de minimus concentration [see 40 CFR 749.68]

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7778-50-9: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7778-50-9: delayed.

Section 313

This material contains Chromic acid, dipotassium salt (listed as Chromium (VI) compounds), 100%, (CAS# 7778-50-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7778-50-9 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-50-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Chromium (VI) compounds- water soluble), Minnesota, (listed as Chromium (VI) compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chromic acid, dipotassium salt, listed as 'Chromium (VI) compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T+ O N

Risk Phrases:

- R 21 Harmful in contact with skin.
- R 25 Toxic if swallowed.
- R 26 Very toxic by inhalation.
- R 34 Causes burns.
- R 42/43 May cause sensitization by inhalation and skin contact.
- R 45 May cause cancer.
- R 46 May cause heritable genetic damage.
- R 8 Contact with combustible material may cause fire.
- R 48/23 Toxic : danger of serious damage to health by prolonged exposure through inhalation.
- R 60 May impair fertility.
- R 61 May cause harm to the unborn child.
- R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S 53 Avoid exposure - obtain special instructions before use.
- S 60 This material and its container must be disposed of as hazardous waste.
- S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7778-50-9: 3

Canada - DSL/NDSL

CAS# 7778-50-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D1A, D2A, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7778-50-9 is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- POTASSIUM FERRICYANIDE -- 6810-00N015820

=====
Product Identification
=====

Product ID:POTASSIUM FERRICYANIDE
MSDS Date:11/09/1988
FSC:6810
NIIN:00N015820
MSDS Number: BPPRV
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100;800-424-9300 (CHEMTREC)
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:FERRATE (3-), HEXACYANO-, TRIPOTASSIUM; (POTASSIUM
FERRICYANIDE) (50 MG/M3 CN IDLH)
CAS:13746-66-2
RTECS #:LJ8225000
Fraction by Wt: 100%
OSHA PEL:5 MG/M3, S (CN) (MFR)

Ingred Name:SUPDAT:NORMAL SALINE OCCAS LIFTING & UPPER & LOWER LIDS,
UNTIL NO EVID OF CHEM REMAINS (APPROX 15-20 MINS). GET (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:MD IMMED. INGEST:IF VICTIM IS CONSCIOUS, IMMED GIVE
2-4 GLASSES OF H*2O & INDUCE VOMIT BY TOUCHING FINGER (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:TO BACK OF THROAT. GET MD IMMEDIATELY.
RTECS #:9999999ZZ

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50:(ORAL,RAT)1600 MG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:INHAL:CERTAIN INDUSTRIAL
PROCESSES MAY RELEASE CYANIDE, WHICH IS CHEMICAL ASPHYXIANANT.
SKIN/EYE:MAY BE IRRITATING. INGEST:CYANIDE SALTS MAY CAUSE

IRREGULAR RESPIRATION, SUDDEN LOSS OF CONSCIOUSNESS, FOLLOWED BY VIOLENT CONVULSIONS, PARALYSIS & DEATH FROM RESPIRATORY ARREST.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Condition Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INHAL:REMOVE FROM EXPOS AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY & BLOOD PRESSURE & ADMINISTER O₂ IF AVAILABLE. KEEP AFFECTED PERSONS WARM & AT REST. TREAT SYMPTOMATICALLY & SUPPORT TIVELY. ADMINISTRATION OF O₂ SHOULD BE PERFORMED BY QUALIFIED PERSONS. GET MEDICAL IMMEDIATELY. SKIN:REMOVE CONTAMINATING CLOTHING & SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP/MILD DETERGENT & LARGE AMOUNTS OF H₂O UNTIL NO EVIDENCE OF CHEMICAL(SUPDAT)

=====
===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CO₂, HALON, WATER SPRAY OR ALCOHOL FOAM. FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT. MOVE CONTAINERS FROM FIRE AREA IF POSSIBLE. FIGHT FIRE FROM MAXIMUM DISTANCE. STAY AWAY FROM STORAGE TANK ENDS. DIKE (SUPDAT)
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

=====
===== Accidental Release Measures =====

Spill Release Procedures:NO SPECIAL PRECAUTIONS INDICATED.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE SUBSTANCES.
Other Precautions:OBSERVE ALL FEDERAL, STATE & LOCAL REGULATIONS WHEN STORING THIS SUBSTANCE. FOR ASSISTANCE, CONTACT DISTRICT DIRECTOR OF EPA.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN WORK PLACE & BE NIOSH/MSHA APPROVED. FOR SPECIFIC RESPIRATOR SELECTION, CONTACT NEHC .
Ventilation:PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION SYSTEM.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING & EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT.
Work Hygienic Practices:CONTACT LENSES SHOULD NOT BE WORN.
Supplemental Safety and Health
FIRE FIGHT PROC:FIRE CONTROL H₂O FOR LATER DISPOSAL. DO NOT SCATTER MATERIAL. USE AGENT SUITABLE FOR TYPE OF FIRE. DO NOT USE H₂O ON MATERIAL. FOR LARGE FIRES USE H₂O IN FLOODING QUANTITIES AS FOG & SPRAY. AVOID BREATHING POISONOUS VAPORS, KEEP UPWIND. FIRST AID PROC:REMAINS (APPROX 15-20 MINUTES). GET MEDICAL IMMEDIATELY. EYE:WASH IMMEDIATELY WITH LARGE AMOUNTS OF H₂O/ (INGESTION 2)

===== Physical/Chemical Properties =====

HCC:N1

Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES

Spec Gravity:1.85

Solubility in Water:33% @ 39F

Appearance and Odor:RUBY RED MONOCLINIC CRYSTALS OR POWDER.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

ACIDS, AMMONIA, CHROMIUM TRIOXIDE, HYDROCHLORIC ACID, SODIUM NITRITE.

Stability Condition to Avoid:AQUEOUS SOLNS MAY DECOMPOSE ON EXPOSURE TO LIGHT.

Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE HIGHLY TOXIC FUMES OF HYDROGEN CYANIDE.

===== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE & LOCAL REGULATIONS WHEN DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT DISTRICT DIRECTOR OF EPA.

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Material Safety Data Sheet

Potassium Ferrocyanide

ACC# 91808

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium Ferrocyanide

Catalog Numbers: S75187

Synonyms: Yellow prussiate of potash; Yellow potassium prussiate; Iron potassium cyanide; Potassium ferrocyanate; Tetrapotassium hexacyanoferrate (II).

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13943-58-3	Potassium Ferrocyanide	ca. 100	237-722-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated. May cause effects

similar to those of acute inhalation.

Inhalation: May cause respiratory tract irritation. May cause anoxia, characterized by weakness, headache, dizziness, confusion, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), weak and irregular heart beat, collapse, unconsciousness, convulsions, coma and death. The toxicological properties of this substance have not been fully investigated.

Chronic: Prolonged or repeated skin contact may cause dermatitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light. Use only in a chemical fume hood.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium Ferrocyanide	none listed	none listed	none listed

OSHA Vacated PELs: Potassium Ferrocyanide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow

Odor: odorless
pH: Not available.
Vapor Pressure: Negligible
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:Decomposes
Decomposition Temperature:> 310 deg C
Solubility: Soluble.
Specific Gravity/Density:1.85 g/cm³
Molecular Formula:C₆FeK₃N₆
Molecular Weight:329.26

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, strong acids, strong bases.
Hazardous Decomposition Products: Hydrogen cyanide, nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 13943-58-3: LJ8219000
LD50/LC50:
CAS# 13943-58-3:
Oral, mouse: LD50 = 5 gm/kg;
Oral, rat: LD50 = 6400 mg/kg;

Carcinogenicity:
CAS# 13943-58-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No information reported
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: ; ; GT 100mg/L No data available.

Environmental: Potassium ferrocyanide is expected to cause little depletion in aquatic systems. It has a moderate potential to affect the germination of some plants. It has a low potential to affect aquatic organisms and secondary waste treatment microorganisms. This chemical is not likely to bioconcentrate.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13943-58-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.**Clean Air Act:**

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 13943-58-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 13943-58-3: No information available.

Canada - DSL/NDSL

CAS# 13943-58-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

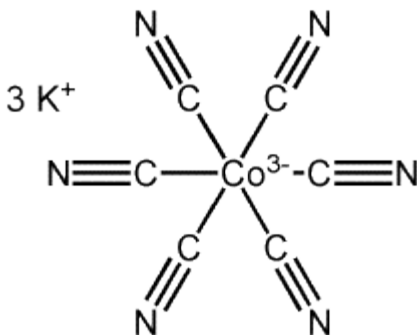
Canadian Ingredient Disclosure List

Potassium hexacyanocobaltate

- Potassium cobalticyanide

Formula $K_3[Co(CN)_6]$

Structure



Description moist, light-yellow crystals crystals.

Registry Numbers and Inventories.

CAS	13963-58-1
NIH PubChem CID	159709
EC (EINECS/ELINCS)	237-742-1
RTECS	GF9470000
RTECS class	Other
UN (DOT)	1588
Merck	12,7801
Beilstein/Gmelin	21682 (G)
Canada DSL/NDSL	NDSL
US TSCA	Listed

Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed

Properties.

Formula	C6CoK3N6
Formula mass	332.33
Melting point, °C	Decomposes
Decomposition point, °C	442 - 458
Density	1.87 g/cm ³

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.
Handling	Wash thoroughly after handling. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Store protected from light. Use only in a chemical fume hood. Wash clothing before reuse.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace

conditions warrant a respirator's use.

Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water. Stop leak only if you can do so without risk.
Stability	Contact with acid liberates gas. Sensitive to Light.
Incompatibilities	Strong oxidizing agents, strong acids.
Decomposition	Hydrogen cyanide, nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.). Substance will react with water (some violently), releasing corrosive and/or toxic gases. Reaction with water may generate much heat which will increase the concentration of fumes in the air. Contact with metals may evolve flammable hydrogen gas.
Combustion products	Fire will produce irritating, corrosive and/or toxic gases.

NFPA	Health	3
	Flammability	0
	Reactivity	0

Health.

Exposure effects	Experimental carcinogen.
Ingestion	Harmful if swallowed. May cause irritation of the digestive tract.
Inhalation	May cause respiratory tract irritation. Harmful if inhaled.
Skin	May cause skin irritation. Harmful if absorbed through the skin.
Eyes	May cause eye irritation.

First aid

Ingestion	Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation	Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Skin	Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Eyes	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number 1588



Material Safety Data Sheet

Potassium iodide

ACC# 19435

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium iodide

Catalog Numbers: AC193790000, AC193790100, AC193790500, AC196730000, AC196730025, AC196735000, AC206470000, AC206471000, AC206475000, AC373650000, AC373651000, AC373655000, AC418260000, AC418261000, 41826-5000, BP367-500, NC9433542, P410-10, P410-100, P410-3, P410-500, P410J-500, P412-10, P412-3, P412-500

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-11-0	Potassium iodide	99.995	231-659-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. May cause reproductive and fetal effects.

Target Organs: Thyroid.

Potential Health Effects

Eye: Causes mild eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause allergic sensitization in certain individuals.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled. May cause respiratory sensitization.

Chronic: May cause reproductive and fetal effects. May interfere with iodine uptake of the thyroid gland and enlarge it. Some references (e.g. Dreisbach's Handbook) say that iodine and iodine compounds are potent sensitizers and that repeated contact may cause sensitivity dermatitis, laryngeal edema, serum sickness with lymph node enlargement, and joint pain and swelling.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Do not store in direct sunlight. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium iodide	none listed	none listed	none listed

OSHA Vacated PELs: Potassium iodide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 7-9 (aq soln)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1330 deg C @ 760 mmHg

Freezing/Melting Point:680 deg C
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:3.13
Molecular Formula:KI
Molecular Weight:166

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive. Moisture sensitive. Light sensitive.
Conditions to Avoid: Incompatible materials, light, dust generation, moisture, prolonged exposure to air.
Incompatibilities with Other Materials: Chloral hydrate, calomel, strong reducing agents, oxidizing agents, alkali metals, metals, metal salts, ozone, perchloryl fluoride, charcoal, bromine trifluoride, chlorine trifluoride.
Hazardous Decomposition Products: Hydrogen iodide, oxides of potassium.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7681-11-0: TT2975000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7681-11-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Potassium iodide has been shown to produce fetotoxicity in newborns.
Teratogenicity: Teratogenic effects have occurred in humans.
Reproductive Effects: Adverse reproductive effects have occurred in humans.
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information available.
Physical: No information available.
Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-11-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7681-11-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7681-11-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7681-11-0: 1

Canada - DSL/NDSL

CAS# 7681-11-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7681-11-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium perchlorate

ACC# 81883

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium perchlorate

Catalog Numbers: AC221360000, AC221360250, AC221365000

Synonyms: None.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-74-7	Potassium perchlorate	100	231-912-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes respiratory tract irritation. Causes eye and skin irritation. May cause blood abnormalities. May cause kidney damage. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, kidneys, thyroid.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: May cause irritation of the digestive tract. May cause kidney damage. In higher doses as an antithyroid agent, it has been associated with gastric irritation, nausea, vomiting, fever, skin rashes, lymphadenopathy, nephrotic syndrome, and rarely leukopenia, agranulocytosis, pancytopenia, and fatal aplastic anemia.

Inhalation: Causes respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause anemia and other blood cell abnormalities.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Oxidizer. Greatly increases the burning rate of combustible materials.

Extinguishing Media: Use water spray to cool fire-exposed containers. For large fires, use water spray or fog. For small fires, use dry chemical, carbon dioxide, halon, or water spray.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: ; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium perchlorate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium perchlorate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 400 deg C (dec)

Decomposition Temperature: > 400 deg C

Solubility: 17 G/L (20°C)

Specific Gravity/Density: 2.52

Molecular Formula: ClKO₄

Molecular Weight: 138.55

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures.

Incompatibilities with Other Materials: Aluminum + aluminum fluoride, aluminum + barium nitrate + potassium nitrate, aluminum powder + titanium dioxide, barium chromate + tungsten and/or titanium, boron + magnesium + silicon rubber, combustible materials, ethanol, ferrocenium diamminetetraakis (thiocyanato-N) chromate(1-), lactose, metal powders, potassium hexacyanocobaltate, reductants, sulfur, titanium hydride.

Hazardous Decomposition Products: Hydrogen chloride, oxides of potassium, oxides of chlorine.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-74-7: SC9700000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7778-74-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Fish toxicity: LC50 golden orfe 1850/2800 mg/LLC100 golden orfe 3550/4000 mg/L

Environmental: No information available.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	POTASSIUM PERCHLORATE, SOLID	POTASSIUM PERCHLORATE
Hazard Class:	5.1	5.1
UN Number:	UN1489	UN1489
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-74-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7778-74-7: immediate, fire, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-74-7 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 9 Explosive when mixed with combustible material.

Safety Phrases:

S 13 Keep away from food, drink and animal feeding stuffs.

S 22 Do not breathe dust.

S 27 Take off immediately all contaminated clothing.

WGK (Water Danger/Protection)

CAS# 7778-74-7: 1

Canada - DSL/NDSL

CAS# 7778-74-7 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Potassium periodate, p.a.

ACC# 96432

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium periodate, p.a.

Catalog Numbers: AC198390000, AC198390050, AC198391000, AC198395000

Synonyms: Potassium iodate

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7790-21-8	Potassium periodate, p.a.	100.0	232-196-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Danger! Oxidizer. Causes respiratory tract irritation. Causes eye and skin irritation. May cause digestive tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Causes skin irritation. Causes redness and pain.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May cause burns to the gastrointestinal tract. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: Causes respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. Causes irritation of mucous membrane. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by

edema.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water with caution and in flooding amounts. Decomposes at high temperatures releasing oxygen which may cause an existing fire to burn more vigorously. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective

Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid breathing dust, vapor, mist, or gas. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents. Heat can cause thermal decomposition and pressure build-up inside containers. Keep containers tightly closed. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium periodate, p.a.	none listed	none listed	none listed

OSHA Vacated PELs: Potassium periodate, p.a.: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Negligible.
Evaporation Rate: Negligible.
Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: 582 deg C
Solubility: Soluble in water.
Specific Gravity/Density: 3.618 at 15C
Molecular Formula: KIO₄
Molecular Weight: 230.0004

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, incompatible materials, ignition sources, dust generation, combustible materials, reducing agents, exposure to moist air or water.
Incompatibilities with Other Materials: Moisture.
Hazardous Decomposition Products: Hydrogen iodide, oxygen, oxides of potassium, iodide ions (I⁻).
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7790-21-8 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7790-21-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found.
Teratogenicity: No information found.
Reproductive Effects: No information found.
Mutagenicity: No information found.
Neurotoxicity: No information found.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, N.O.S.	OXIDIZING SOLID NOS (POTASSIUM PERIODATE)
Hazard Class:	5.1	5.1
UN Number:	UN1479	UN1479
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7790-21-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7790-21-8: acute, flammable, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7790-21-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 24/25 Avoid contact with skin and eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7790-21-8: 1

Canada - DSL/NDSL

CAS# 7790-21-8 is listed on Canada's DSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Potassium permanganate

ACC# 19520

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium permanganate

Catalog Numbers: AC196750000, AC196750010, AC196752500, AC207740000, AC207740010, AC207740250, AC218680000, AC218681000, AC424170000, AC424170250, 19675-0250, 19675-5000, 20774-5000, 42417-0025, 42417-5000, NC9368615, NC9667433, P279-212, P279-500, P287-212, P287-500

Synonyms: Permanganic acid, potassium salt; Permanganate of potash; Chameleon mineral.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7722-64-7	Potassium permanganate	>98	231-760-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: bronze crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes severe eye and skin irritation with possible burns. May be harmful if swallowed. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: Central nervous system, lungs, respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes severe eye irritation and possible burns. May cause chemical conjunctivitis and corneal damage. Recovery is usually complete, but in severe cases, permanent damage such as a dense, white cloudiness of the cornea may occur.

Skin: Causes skin irritation and possible burns. Skin contact can cause brown stains in the area, and possible hardening of the outer skin layer.

Ingestion: May cause liver and kidney damage. May cause perforation of the digestive tract. May cause central nervous system effects. In high doses, manganese may increase anemia by interfering with iron absorption.

Inhalation: Causes respiratory tract irritation with possible burns. The lowest exposure concentration of manganese at which early effects on the CNS and the lungs may occur is still unknown. However, once neurological signs are present, they tend to continue and worsen after exposure ends. Extreme exposures could result in a build-up of fluid in the lungs (pulmonary edema) that might be fatal in severe cases.

Chronic: Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. Other chronic effects from inhaling high amounts of manganese include an increased incidence of cough and bronchitis and susceptibility to infectious lung disease.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse. NOTE: Contaminated clothing may be a fire hazard.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Strong oxidizer. Contact with other material may cause fire. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Use large quantities of water. Do not use dry chemicals, CO₂, Halon or foams.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep from contact with clothing and other combustible materials. Discard contaminated shoes. Do not breathe dust. Do not breathe spray or mist. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Keep away from flammable liquids. Keep away from reducing agents. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium permanganate	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.).500 mg/m ³ IDLH (as Mn) (listed under Manganese	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).

		compounds, n.o.s.).	
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OSHA Vacated PELs: Potassium permanganate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: dark purple - bronze

Odor: odorless

pH: 7-9 (20 g/l H₂O)

Vapor Pressure: Negligible

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: 240 deg C

Decomposition Temperature: 150 deg C

Solubility: 6.4 g/100 ml @ 20°C

Specific Gravity/Density: 2.700 g/cm³

Molecular Formula: KMnO₄

Molecular Weight: 158.03

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, temperatures above 150°C.

Incompatibilities with Other Materials: Strong reducing agents, organic materials, arsenites, bromides, iodides, hydrochloric acid, charcoal, mercurous salts, hypophosphites, sulfites, alcohols, ferrous salts, strong acids, some metals, formaldehyde, metal powders, ethylene glycol, peroxides, combustible organics.

Hazardous Decomposition Products: Oxygen, oxides of potassium, oxides of manganese.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7722-64-7: SD6475000

LD50/LC50:

CAS# 7722-64-7:

Oral, mouse: LD50 = 2157 mg/kg;

Oral, mouse: LD50 = 750 mg/kg;

Oral, rat: LD50 = 750 mg/kg;

The estimated lethal human dose by ingestion is 10 grams, with death being delayed by up to one month: Oral, rat: LD50 = 1090 mg/kg. Oral, human: LDLo = 143 mg/kg.

Carcinogenicity:

CAS# 7722-64-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The U.S. EPA stated that epidemiological studies of inorganic manganese compounds in humans indicate effects on the respiratory system at levels below 1 mg/m³.

Teratogenicity: No information found

Reproductive Effects: Men exposed to manganese dusts showed a decrease in fertility.

Mutagenicity: Micronucleus Test: Oral, mouse = 205 mg/kg/24H (Continuous).; Cytogenetic Analysis: Oral, mouse = 718 mg/kg/7D (Continuous).; Cytogenetic Analysis: Mouse, Mammary gland = 1 mmol/L/48H.; Sperm Morphology: Oral, mouse = 513 mg/kg/5D (Continuous).

Neurotoxicity: Manganese is neurotoxic.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC50 = 0.75 mg/L; 96 Hr; UnspecifiedFish: Goldfish: LC50 = 3.6 mg/L; 24 Hr; UnspecifiedFish: Striped bass: LC50 = 1.5-5.0 mg/L; 24 Hr; Static bioassay No data available.

Environmental: No information available.

Physical: No information available.

Other: Harmful to aquatic life in very low concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	POTASSIUM PERMANGANATE	POTASSIUM PERMANGANATE
Hazard Class:	5.1	5.1
UN Number:	UN1490	UN1490
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7722-64-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7722-64-7: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7722-64-7: immediate, delayed, fire.

Section 313

This material contains Potassium permanganate (listed as Manganese compounds, n.o.s.), >98%, (CAS# 7722-64-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7722-64-7 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7722-64-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7722-64-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Manganese compounds, n.o.s.), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O N

Risk Phrases:

R 22 Harmful if swallowed.
R 8 Contact with combustible material may cause fire.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 60 This material and its container must be disposed of as hazardous waste.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7722-64-7: 2

Canada - DSL/NDSL

CAS# 7722-64-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, E.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7722-64-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium phosphate, monobasic

ACC# 19543

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium phosphate, monobasic

Catalog Numbers: AC205920000, AC205920025, AC205925000, AC271080000, AC271080025, AC424200000, AC424200250, AC424205000, BP362-1, BP362-500, NC9072700, NC9179992, P284-500, P285-10, P285-250LB, P285-3, P285-3LC, P285-50, P285-500, P286-1, P380-12, P380-212, P380-250LB, P380-500, P382-500, P386-500, P386SAM1, P386SAM2, P386SAM3

Synonyms: Dihydrogen potassium phosphate; Monopotassium phosphate; Phosphoric acid, monopotassium salt; Potassium dihydrogen phosphate; Potassium dihydrogen orthophosphate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-77-0	Potassium phosphate, monobasic	>99	231-913-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white crystals.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause irritation of the digestive tract. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation.

Chronic: Ingestion of large doses may cause nausea, vomiting, diarrhea. Chronic exposure to this product may cause calcium phosphate deposition in the kidneys.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Persons with impaired kidney function may be more susceptible to the effects of this substance. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid breathing dust, mist, or vapor. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium phosphate, monobasic	none listed	none listed	none listed

OSHA Vacated PELs: Potassium phosphate, monobasic: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: fine - colorless to white

Odor: Odorless
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 252.6 deg C
Decomposition Temperature: > 253 deg C
Solubility: Soluble.
Specific Gravity/Density: 2.338 g/cm³
Molecular Formula: KH₂PO₄
Molecular Weight: 136.08

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation, moisture.
Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants..
Hazardous Decomposition Products: Oxides of phosphorus, irritating and toxic fumes and gases.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7778-77-0: TC6615500
LD50/LC50:
CAS# 7778-77-0:
Skin, rabbit: LD50 = >4640 mg/kg;

Carcinogenicity:
CAS# 7778-77-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: When too many nutrients such as phosphorus are in the water, algae grows maniacally. Algae blooms are followed by a die-off, and as material decays, it consumes oxygen like a forest fire. No fish, plants or insects can live in oxygen-free zones.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-77-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7778-77-0: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-77-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7778-77-0: 1

Canada - DSL/NDSL

CAS# 7778-77-0 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

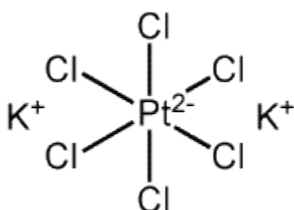
Canadian Ingredient Disclosure List

Potassium hexachloroplatinate

- Potassium chloroplatinate
- Potassium platinum chloride

Formula K_2PtCl_6

Structure



Description yellow-orange cubic crystals.

Uses Substance is used in photography.

Registry Numbers and Inventories.

CAS	16921-30-5
NIH PubChem CID	61856
EC (EINECS/ELINCS)	240-979-3
EC Index Number	078-007-00-3
EC Class	T; R25, Xi; R41, R42/43
RTECS	TP1650000
RTECS class	Mutagen; Human Data
UN (DOT)	1759
Merck	12,7800
Beilstein/Gmelin	24078 (G)

Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	Cl ₆ K ₂ Pt
Formula mass	485.99
Melting point, °C	250
Density	3.344 g/cm ³
Solubility in water	7.7 g/L (20 C)

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Wash thoroughly after handling. Use only in a well ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Platinum is incompatible with aluminum, acetone, arsenic, carbon + methanol, nitrosyl chloride, dioxygen difluoride, ethanol, hydrazine, hydrogen + air, hydrogen peroxide, lithium, methyl hydroxyperoxide, ozonides, peroxymonosulfuric acid, phosphorus, selenium, tellurium, vanadium dichloride + water.
Decomposition	Chlorine.

Fire.

Flash Point, °C	250
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Extinguishing media: Use agent most appropriate to extinguish fire.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Contact with metals may evolve flammable hydrogen gas.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure effects	Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation may cause effects similar to those of acute inhalation.
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Ingestion	May cause irritation of the digestive tract.
Inhalation	May cause asthmatic attacks due to allergic sensitization of the respiratory tract. Causes irritation of mucous membrane. Inhalation may produce lachrimation, sneezing, rhinorrhea, cough, dyspnea, bronchial asthma, and cyanosis.
Skin	May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Contact with the skin may cause urticaria (hives).
Eyes	May cause eye irritation. May cause conjunctivitis.

First aid

Ingestion	If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation	Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Skin	Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.
Eyes	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number	1759
Response guide	154
Hazard class	8
Packing Group	I; II; III



Material Safety Data Sheet

Potassium sulfate

ACC# 19590

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium sulfate

Catalog Numbers: AC205940000, AC205945000, AC207770000, AC207775000, AC424210000, AC424210010, AC424220000, AC424220010, AC424220250, NC9179989, P304-10, P304-3, P304-500, P305-500, P306-300LB

Synonyms: Dipotassium sulfate; Potassium sulfate (2:1); Sulfuric acid, dipotassium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-80-5	Potassium sulfate	>99	231-915-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Low hazard for usual industrial handling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Potassium sulfate has been used as a cathartic.

Inhalation: Inhalation of dust may cause respiratory tract irritation.
Chronic: Not expected to be a chronic hazard.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust

generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry place. Keep container closed when not in use.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Glove protection is not normally required.

Clothing: Protective garments not normally required.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Odorless

pH: ~ 7 (aq soln)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1689 deg C @ 760 mmHg

Freezing/Melting Point: 1067 deg C

Decomposition Temperature: Not available.

Solubility: 110 g/l (20°C)

Specific Gravity/Density: 2.66 g/cm³

Molecular Formula: K₂O₄S

Molecular Weight: 174.26

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants.

Hazardous Decomposition Products: Oxides of sulfur, oxides of potassium.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-80-5: TT5900000

LD50/LC50:

CAS# 7778-80-5:

Oral, mouse: LD50 = 6600 mg/kg;

Oral, rat: LD50 = 6600 mg/kg;

Carcinogenicity:

CAS# 7778-80-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: This chemical has no biological oxygen demand, and it will not cause oxygen depletion in aquatic systems. It has a low potential to affect aquatic systems. If diluted with water, this chemical released directly or indirectly into the environment is not expected to have a significant impact.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-80-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-80-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7778-80-5: 1

Canada - DSL/NDSL

CAS# 7778-80-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Potassium bromide

ACC# 19280

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium bromide

Catalog Numbers: AC196480000, AC196480010, AC206390000, AC206391000, AC222550000, AC222551000, AC222555000, AC423010000, AC423011000, AC424070000, AC424070025, AC424070050, 42407-5000, P205-3, P205-500, P227-25

Synonyms: Hydrobromic acid potassium salt; Bromide salt of potassium.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7758-02-3	Potassium bromide	>98	231-830-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Causes eye irritation. Possible risk of harm to the unborn child. May cause central nervous system effects. Hygroscopic (absorbs moisture from the air).

Target Organs: Central nervous system, eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation. Exposure to bromides may cause rashes, especially of the face (resembling acne) and boils.

Ingestion: May cause central nervous system depression, characterized by excitement,

followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.

Inhalation: Inhalation of bromides may cause irritation of the upper respiratory tract and lung tissue.

Chronic: Chronic ingestion may cause bromism characterized by disturbances of the central nervous system, skin and digestive tract. Repeated oral intake of bromides (>9 mg/kg/day) may affect the central nervous system. Warning symptoms include mental dullness, slurred speech, weakened memory, apathy, anorexia, constipation, drowsiness and loss of sensitivity to touch and pain.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry place. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium bromide	none listed	none listed	none listed

OSHA Vacated PELs: Potassium bromide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: Neutral in solution.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: 1435 deg C
Freezing/Melting Point:730 deg C
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:2.75
Molecular Formula:KBr
Molecular Weight:119

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Dust generation, moisture.

Incompatibilities with Other Materials: Strong acids.

Hazardous Decomposition Products: Hydrogen bromide, oxides of potassium.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7758-02-3: TS7650000

LD50/LC50:

CAS# 7758-02-3:

Oral, mouse: LD50 = 3120 mg/kg;

Oral, rat: LD50 = 3070 mg/kg;

Carcinogenicity:

CAS# 7758-02-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Two children born to a woman who ingested large amounts of bromides throughout both pregnancies had heights and head circumferences below the 5th percentile and a two year lag in bone ages when they were 7 and 8 years old (Opitz et al, 1972).

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-02-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7758-02-3: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7758-02-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

WGK (Water Danger/Protection)

CAS# 7758-02-3: 1

Canada - DSL/NDSL

CAS# 7758-02-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7758-02-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium chlorate

ACC# 19300

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium chlorate

Catalog Numbers: AC208860000, AC208860010, AC208860050, AC418190000, AC418190050, AC418195000, P210-500, P212-100, P212-500

Synonyms: Berthollet's Salt; Salt of Tarter; Chlorate of Potash; Chloric Acid, Potassium Salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
3811-04-9	Potassium chlorate	99-100	223-289-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! Explosive when mixed with combustible material. Strong oxidizer. Contact with other material may cause a fire. May cause severe eye, skin and respiratory tract irritation with possible burns. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May be harmful if swallowed. May cause blood abnormalities. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). May cause kidney damage.

Target Organs: Blood, kidneys.

Potential Health Effects

Eye: May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause severe irritation and possible burns.

Ingestion: May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood. May cause burns to the gastrointestinal tract. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: Dust is irritating to the respiratory tract. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood.

Antidote: Methylene blue, alone or in combination with oxygen is indicated as a treatment in nitrite induced methemoglobinemia.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Use water spray to keep fire-exposed containers cool. Use water with caution and in flooding amounts. Some oxidizers may react explosively with hydrocarbons(fuel). Containers may explode when heated.

Extinguishing Media: Contact professional fire-fighters immediately. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires,

flood fire area with water from a distance. Contact with water or steam may produce toxic and flammable vapors.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Remove all sources of ignition. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool, dry place. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium chlorate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium chlorate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: 356 deg C

Decomposition Temperature: 400 deg C

Solubility: Not available.

Specific Gravity/Density: 2.52

Molecular Formula: KClO₃

Molecular Weight: 122.5495

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, dust generation, combustible materials, reducing agents.

Incompatibilities with Other Materials: Reducing agents.

Hazardous Decomposition Products: Chlorine, chlorine, oxygen, oxides of potassium.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 3811-04-9: FO0350000

LD50/LC50:

CAS# 3811-04-9:

Oral, rat: LD50 = 1870 mg/kg;

Carcinogenicity:

CAS# 3811-04-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Harmful to aquatic environments.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	POTASSIUM CHLORATE	POTASSIUM CHLORATE
Hazard Class:	5.1	5.1
UN Number:	UN1485	UN1485
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 3811-04-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 3811-04-9: immediate, delayed, fire.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 3811-04-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O N

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 9 Explosive when mixed with combustible material.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

- S 13 Keep away from food, drink and animal feeding stuffs.
- S 16 Keep away from sources of ignition - No smoking.
- S 27 Take off immediately all contaminated clothing.
- S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 3811-04-9: 2

Canada - DSL/NDSL

CAS# 3811-04-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Potassium chloride

ACC# 19310

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium chloride

Catalog Numbers: AC193780000, AC193780010, AC193780050, AC196770000, AC196770010, AC424090000, AC424090030, AC424090250, S77375, S77375-1, S77375-2, S79807, 42409-0010, BP366-1, BP366-500, NC9545334, P217-10, P217-250LB, P217-3, P217-500, P217-500LC, P330-250LB, P330-3, P330-500, P333-250LB, P333-3, P333-500, P335-12, P335-212, P335-SAM1, P33512LC

Synonyms: KCl.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7447-40-7	Potassium chloride	99+	231-211-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause irritation of the digestive tract. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium chloride	none listed	none listed	none listed

OSHA Vacated PELs: Potassium chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1420 deg C @ 760 mmHg

Freezing/Melting Point: 770 deg C

Decomposition Temperature: Not available.

Solubility: 340 g/L (20°C)

Specific Gravity/Density: 1.987

Molecular Formula:KCl
Molecular Weight:74.54

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Bromine trifluoride, strong oxidizing agents, strong acids, sulfuric acid, potassium permanganate.

Hazardous Decomposition Products: Hydrogen chloride, chlorine, carbon monoxide, carbon dioxide, potassium fume.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7447-40-7: TS8050000

LD50/LC50:

CAS# 7447-40-7:

Draize test, rabbit, eye: 500 mg/24H Mild;

Oral, mouse: LD50 = 1500 mg/kg;

Oral, rat: LD50 = 2600 mg/kg;

Carcinogenicity:

CAS# 7447-40-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Unscheduled DNA Synthesis: Oral, rat = 1500 ug/kg.; Mutation in Microorganisms = Mouse, Lymphocyte = 2048 mg/L.; DNA Damage = Hamster, Ovary = 260 mmol/L.; Cytogenetic Analysis: Hamster, Lung = 12 gm/L.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7447-40-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7447-40-7: immediate.

Section 313

This material contains Potassium chloride (listed as Water Dissociable Nitrate Compounds), 99+%, (CAS# 7447-40-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7447-40-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7447-40-7: 1

Canada - DSL/NDSL

CAS# 7447-40-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7447-40-7 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium chromate

ACC# 19320

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium chromate

Catalog Numbers: AC202340000, AC202340050, AC202345000, P220-100, P220-3, P220-500, S71231

Synonyms: Chromic acid, dipotassium salt; Chromate of potassium; Neutral potassium chromate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7789-00-6	Chromic acid dipotassium salt	>99.5	232-140-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. May cause allergic skin reaction. Cancer hazard. May be harmful if absorbed through the skin.

Target Organs: Kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-

exposure to this material. Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause dermatitis.

Ingestion: May cause severe and permanent damage to the digestive tract. May cause liver and kidney damage. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea.

Inhalation: May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation. Causes chemical burns to the respiratory tract. May cause chemical bronchitis with coughing and difficulty in breathing.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Prolonged or repeated exposure may lead to asthma and perforation of the nasal septum. Repeated inhalation may cause chronic bronchitis. May cause liver and kidney damage. May cause cancer in humans.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Containers may explode in the heat of a fire. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Do NOT use dry chemicals, CO₂, Halon or foams. Use water only in flooding quantities as fog.

Flash Point: Not available.

Autoignition Temperature: None reported.

Explosion Limits, Lower: None reported.

Upper: None reported.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Use with adequate ventilation. Discard contaminated shoes.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromic acid dipotassium salt	0.05 mg/m ³ TWA (as Cr) (listed under Chromium (VI) compounds- water soluble).	0.001 mg/m ³ TWA (as Cr) (listed under Chromates). 15 mg/m ³ IDLH (as Cr(VI)) (listed under Chromates).	5 æg/m ³ TWA (listed under Chromium (VI) compounds). 0.1 mg/m ³ Ceiling (as CrO ₃ , applies to any operations or sectors for which the H exavalent Chromium standard [29 CFR 1910.1026] is stayed or is otherwise not in effect) (listed under Chromates). 2.5 æg/m ³ Action Level (as Cr.); 5 æg/m ³ TWA (as Cr, Cancer hazard - see 29

			CFR 1910.1026) (listed under Chromium (VI) compounds).
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OSHA Vacated PELs: Chromic acid dipotassium salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow

Odor: odorless

pH: 8.6-9.8 (5% soln)

Vapor Pressure: 0

Vapor Density: Not applicable.

Evaporation Rate:Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point:975 deg C

Decomposition Temperature:Not available.

Solubility: Soluble.

Specific Gravity/Density: 2.7320

Molecular Formula:K₂CrO₄

Molecular Weight:194.20

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Hydrazine, combustible, organic, or other readily oxidizable materials: paper, wood, sulfur, aluminum, plastics, chromic acid, chromates.

Hazardous Decomposition Products: Oxides of potassium, toxic chromium oxide fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:**CAS#** 7789-00-6: GB2940000**LD50/LC50:**

CAS# 7789-00-6:

Oral, mouse: LD50 = 180 mg/kg;

Carcinogenicity:

CAS# 7789-00-6:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Chromium (VI) compounds-water soluble').
- **California:** carcinogen, initial date 2/27/87 (listed as Chromium (VI) compounds).
- **NTP:** Known carcinogen (listed as Chromium (VI) compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion.

Teratogenicity: TDLo (Intraperitoneal, mouse) = 30 mg/kg

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms (Salmonella typhimurium) = 35 ug/plate
Mutation in microorganisms (Salmonella typhimurium) = 10 ug/plate

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. LC50 Physa heterostropha (snail) 31,600 ug/l as chromium; water hardness as 171 mg/l as calcium carbonate; static unmeasured method LC50 Daphnia magna (Cladoceran) 137,66.7 and 15.3 ug/l as chromium; water hardnesses of 212,188 and 50 as calcium carbonate, respectively, and with pH values of 8.2 to 8.4, 7.5 to 7.5 to 7.6, and 7.5, respectively; static measured method.

Environmental: Aquatic Fate: Cr(VI) exists in solution as hydrochromate, chromate, and dichromate ionic species. The proportion of each ion in solution is dependent on pH. In strongly basic and neutral pHs, the chromate form predominates. Chromium is present usually as Cr(III) in the soil and is characterized by its lack of mobility, except in cases where Cr(VI) is involved. Chromium (VI) of natural origin is rarely found.

Physical: As the pH is lowered, the hydrochromate concentration increases. At very low pHs, the dichromate species predominates. In the pH ranges encountered in natural water, the predominant forms are hydrochromate ions (63.6%) at pH 6.0 to 6.2 and chromate ion

(95.7%) at pH 7.8 to 8.5. The oxidizing ability of Cr(VI) in aqueous solution is pH dependent.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, TOXIC, N.O.S.	Oxidizing Solid, Toxic, N.O.S. (POTASSIUM CHROMATE)
Hazard Class:	5.1	5.1
UN Number:	UN3087	UN3087
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7789-00-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 7789-00-6: Section 6, 0.1 % de minimus concentration [see 40 CFR 749.68]

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7789-00-6: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7789-00-6: immediate, delayed.

Section 313

This material contains Chromic acid dipotassium salt (listed as Chromium (VI) compounds), >99.5%, (CAS# 7789-00-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7789-00-6 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7789-00-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Chromium (VI) compounds- water soluble), Minnesota, (listed as Chromium (VI) compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chromic acid dipotassium salt, listed as 'Chromium (VI) compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T O N

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 43 May cause sensitization by skin contact.

R 46 May cause heritable genetic damage.

R 8 Contact with combustible material may cause fire.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7789-00-6: 2

Canada - DSL/NDSL

CAS# 7789-00-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2A, D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7789-00-6 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium iodate

ACC# 19445

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium iodate

Catalog Numbers: AC196740000, AC196741000, AC196745000, AC201770000, AC201771000, AC201775000, AC418240000, AC418240050, AC418241000, 41824-5000, P253-100, P253-500

Synonyms: Iodic acid, potassium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7758-05-6	Potassium iodate	100	231-831-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause severe eye, skin and respiratory tract irritation with possible burns. May cause kidney damage. May cause central nervous system effects.

Target Organs: Kidneys, central nervous system.

Potential Health Effects

Eye: May cause eye irritation. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: May cause severe irritation and possible burns.

Ingestion: May cause burns to the gastrointestinal tract. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Prolonged or repeated skin contact may cause irritation. Prolonged or repeated exposure may cause gastrointestinal irritation and kidney damage. Chronic ingestion may cause central nervous system failure. Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Get medical aid. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Use water spray to keep fire-exposed containers cool. Use water with caution and in flooding amounts. This material is an explosion hazard when exposed to heat, mechanical shock, or friction. Containers may explode when heated. Runoff to sewer may create fire or explosion hazard.

Extinguishing Media: Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid contact with clothing and other combustible materials. Keep from contact with clothing and other combustible materials. Avoid breathing dust. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from flammable liquids. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium iodate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium iodate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 560 deg C
Decomposition Temperature: 560 deg C
Solubility: Soluble in water
Specific Gravity/Density: 3.89
Molecular Formula: KIO₃
Molecular Weight: 214.00

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, dust generation.
Incompatibilities with Other Materials: Reducing agents, combustible materials, flammable liquids.
Hazardous Decomposition Products: Irritating and toxic fumes and gases, oxides of potassium, iodine.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7758-05-6: NN1350000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7758-05-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.

Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, N.O.S.	OXIDIZING SOLID NOS (POTASSIUM IODATE)
Hazard Class:	5.1	5.1
UN Number:	UN1479	UN1479
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-05-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7758-05-6: fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7758-05-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

O

Risk Phrases:

R 22 Harmful if swallowed.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

WGK (Water Danger/Protection)

CAS# 7758-05-6: 1

Canada - DSL/NDSL

CAS# 7758-05-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Potassium pyrosulfate, p.a.

ACC# 45399

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium pyrosulfate, p.a.

Catalog Numbers: AC207910000, AC207910250, AC207915000, P195-3, P195-500

Synonyms: Potassium disulfate; Potassium hydrogen sulfate, anhydrous; Potassium pyrosulfate

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7790-62-7	Potassium pyrosulfate	99.0%	232-216-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Danger! Corrosive. Causes eye and skin burns. Causes digestive and respiratory tract burns. Moisture sensitive.

Target Organs: Respiratory system, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye burns. May cause permanent visual impairment. Risk of serious damage to eyes.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Ingestion: May cause corrosion and permanent tissue destruction of the esophagus and

digestive tract.

Inhalation: Causes chemical burns to the respiratory tract.

Chronic: Chronic exposure may cause effects similar to those of acute exposure.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is nonflammable; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium pyrosulfate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium pyrosulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear a chemical apron.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not available.
Freezing/Melting Point: 325 deg C
Decomposition Temperature: Not available.
Solubility: may decompose
Specific Gravity/Density: 2.5120g/cm³
Molecular Formula: K₂O₇S₂
Molecular Weight: 254.31

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Moisture sensitive. Readily hydrolyzed by moisture. Decomposes in the presence of water or acids to form sulfuric acid.

Conditions to Avoid: Incompatible materials, dust generation, moisture.

Incompatibilities with Other Materials: Oxidizing agents, reducing agents, acids, bases, alkalis.

Hazardous Decomposition Products: Oxides of potassium, sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7790-62-7 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7790-62-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: *Pseudomonas putida*: Fish: *Pseudomonas putida*:

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	POTASSIUM HYDROGEN SULFATE
Hazard Class:	8	8
UN Number:	UN3260	UN2509
Packing Group:	III	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7790-62-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7790-62-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 34 Causes burns.

R 41 Risk of serious damage to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 7790-62-7: No information available.

Canada - DSL/NDSL

CAS# 7790-62-7 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Potassium sodium tartrate tetrahydrate

ACC# 21570

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium sodium tartrate tetrahydrate

Catalog Numbers: AC202860000, AC202860050, 20286-0010, 20286-5000, S386-12, S386-212, S386-500, S387-10, S387-3, S387-500

Synonyms: Sodium potassium tartrate tetrahydrate; Rochelle salt; Seignette salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6381-59-5	Tartrate, potassium sodium	>99	206-156-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tartrate, potassium sodium	none listed	none listed	none listed
Butanedioic acid, 2,3-dihydroxy-[R-(R*,R*)]-, monopotassium	none listed	none listed	none listed

OSHA Vacated PELs: Tartrate, potassium sodium: No OSHA Vacated PELs are listed for this chemical. Butanedioic acid, 2,3-dihydroxy-[R-(R*,R*)]-, monopotassium: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: none reported

pH: 5.5-8.5 (5% aq.sol. 20°C)

Vapor Pressure: Not available.

Vapor Density: Not applicable.

Evaporation Rate: Negligible

Viscosity: No data

Boiling Point: 220 deg C

Freezing/Melting Point: 70 - 80 deg C

Decomposition Temperature: 220 deg C

Solubility: 630 g/l (20°C)

Specific Gravity/Density: Not available.

Molecular Formula:NaKC4H4O6.4H2O

Molecular Weight:282.22

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, sodium oxide, oxides of potassium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6381-59-5 unlisted.

CAS# 304-59-6 unlisted.

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 6381-59-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 304-59-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6381-59-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 304-59-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 6381-59-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6381-59-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 304-59-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 6381-59-5: 0

CAS# 304-59-6: 1

Canada - DSL/NDSL

CAS# 304-59-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Aluminum ammonium sulfate dodecahydrate

ACC# 00877

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum ammonium sulfate dodecahydrate

Catalog Numbers: AC206260000, AC206260010, AC206260025, AC206260050, AC400540000, AC400545000, A567-500

Synonyms: Ammonium alum dodecahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7784-26-1	Aluminum ammonium sulfate dodecahydrate	>97	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. May cause liver damage.

Target Organs: Liver.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver damage.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause irritation.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum ammonium sulfate dodecahydrate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed
Ammonium alum anhydrous	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum ammonium sulfate dodecahydrate: No OSHA Vacated PELs are listed for this chemical. Ammonium alum anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 120 deg C
Freezing/Melting Point:94.4 deg C
Decomposition Temperature:280 deg C
Solubility: 150 g/l (20 C)
Specific Gravity/Density: 1.6 (water=1)
Molecular Formula:AINH4S2O8.12H2O
Molecular Weight:453.2922

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: None reported.
Incompatibilities with Other Materials: None reported.
Hazardous Decomposition Products: Nitrogen oxides, oxides of sulfur, ammonia and/or derivatives.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7784-26-1: WS5640010
CAS# 7784-25-0 unlisted.
LD50/LC50:
Not available.
Not available.

Carcinogenicity:
CAS# 7784-26-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7784-25-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-26-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7784-25-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7784-26-1: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7784-26-1 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

CAS# 7784-25-0 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7784-26-1: 1

CAS# 7784-25-0: No information available.

Canada - DSL/NDSL

CAS# 7784-26-1 is listed on Canada's DSL List.

CAS# 7784-25-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7784-26-1 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

CAS# 7784-25-0 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List

Material Safety Data Sheet

p-Phenylenediamine dihydrochloride, 99+%

ACC# 39050

Section 1 - Chemical Product and Company Identification

MSDS Name: p-Phenylenediamine dihydrochloride, 99+%

Catalog Numbers: AC417480000, AC417481000

Synonyms: p-Aminoaniline dihydrochloride; 4-Aminoaniline dihydrochloride; p-Benzenediamine dihydrochloride.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
624-18-0	p-Phenylenediamine dihydrochloride	>99	210-834-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to slight red solid.

Warning! Harmful if swallowed, inhaled, or absorbed through the skin. Causes eye irritation. May cause allergic skin reaction. May cause skin and respiratory tract irritation.

Target Organs: Blood, eyes, skin.

Potential Health Effects

Eye: Causes severe eye irritation. Contact with the eye may cause sensitization of the ocular structures. May cause ulceration of the the cornea with loss of vision

Skin: Causes severe skin irritation. May be absorbed through the skin in harmful amounts. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: May cause irritation of the digestive tract. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient

oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.

Inhalation: May cause respiratory tract irritation. Inhalation of aniline causes anoxia due to the formation of methemoglobin.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
p-Phenylenediamine dihydrochloride	none listed	none listed	none listed

OSHA Vacated PELs: p-Phenylenediamine dihydrochloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to slight red

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: freely soluble
Specific Gravity/Density: >1.0
Molecular Formula: C₆H₈N₂·2HCl
Molecular Weight: 181.07

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 624-18-0: ST0350000
LD50/LC50:
CAS# 624-18-0:
Oral, mouse: LD50 = 316 mg/kg;
Oral, rat: LD50 = 147 mg/kg;

Carcinogenicity:
CAS# 624-18-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	PHENYLENEDIAMINES	PHENYLENEDIAMINES
Hazard Class:	6.1	6.1
UN Number:	UN1673	UN1673
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 624-18-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 624-18-0: immediate.

Section 313

This material contains p-Phenylenediamine dihydrochloride (CAS# 624-18-0, >99%), which is subject to the reporting requirements of Section 313 of SARA Title

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 624-18-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 36 Irritating to eyes.

R 43 May cause sensitization by skin contact.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 28A After contact with skin, wash immediately with plenty of water.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 624-18-0: No information available.

Canada - DSL/NDSL

CAS# 624-18-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled

Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 624-18-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Silicon Carbide, 325 Mesh

ACC# 98933

Section 1 - Chemical Product and Company Identification

MSDS Name: Silicon Carbide, 325 Mesh

Catalog Numbers: AC313650000, AC313660000

Synonyms: Silicon Carbide.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
409-21-2	Silicon Carbide	ca 100	206-991-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to black solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause lung damage.

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: Dust is irritating to the respiratory tract. May cause lung damage. Contains crystalline silica which may lead to respiratory abnormalities and silicosis.

Chronic: Chronic inhalation of dust may lead to silicosis. May cause lung damage. May cause silicosis-disabling pulmonary fibrosis characterized by fibrotic changes and miliary nodules in the lungs, dry cough, shortness of breath, emphysema, decreased chest expansion and increased susceptibility to tuberculosis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. Use extinguishing media appropriate to the surrounding fire. Dousing metallic fires with water may generate hydrogen gas, an extremely dangerous explosion hazard.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a dry area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silicon Carbide	10 mg/m ³ TWA (nonfibrous, inhalable fraction, particulate matter containing no asbestos and <1% crystalline silica); 3 mg/m ³ TWA (nonfibrous, respirable fraction, particulate matter containing no asbestos and <1% crystalline silica); 0.1 fiber/cm ³ TWA (respirable fibers, including	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Silicon Carbide: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear safety goggles approved for the handling of explosive materials.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to black

Odor: none reported

pH: Not available.

Vapor Pressure: Not applicable.
Vapor Density: Not available.
Evaporation Rate:Not applicable.
Viscosity: Not applicable.
Boiling Point: Not applicable.
Freezing/Melting Point:2700 deg C
Decomposition Temperature:Not available.
Solubility: insoluble in water
Specific Gravity/Density:3.2
Molecular Formula:SiC
Molecular Weight:40.0855

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation, excess heat.
Incompatibilities with Other Materials: None reported.
Hazardous Decomposition Products: Oxides of silicon.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 409-21-2: VW0450000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 409-21-2:

- **ACGIH:** A2 - Suspected Human Carcinogen (fibrous, including whiskers)
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: An examination of 53 silicon carbide crushers showed 15 cases of pneumoconiosis in workers employed on the crushing, sieving and packing of silicon carbide have been reported.

Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information reported.

Environmental: No information reported.

Physical: No information reported.

Other: None

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 409-21-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 409-21-2 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 409-21-2: No information available.

Canada - DSL/NDSL

CAS# 409-21-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Silicone Oil, High Temperature

ACC# 77829

Section 1 - Chemical Product and Company Identification

MSDS Name: Silicone Oil, High Temperature

Catalog Numbers: AC174660000, AC174661000, AC174665000

Synonyms: None.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
63148-58-3	Silicone oil	ca.100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless to light straw liquid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 315 deg C (599.00 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before

reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silicone oil	none listed	none listed	none listed

OSHA Vacated PELs: Silicone oil: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear, colorless to light straw

Odor: None reported.

pH: Not available.

Vapor Pressure: < 5 mm Hg @ 25 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 1.0500 g/cm³

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Strong oxidants, silicon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 63148-58-3 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 63148-58-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 63148-58-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 63148-58-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 63148-58-3: No information available.

Canada - DSL/NDSL

CAS# 63148-58-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

DIHOMA CHEMICAL MANUFACURING, INC. -- SILVER METAL POLISH -- 7930-00-993-6499

=====
===== Product Identification =====

Product ID:SILVER METAL POLISH
MSDS Date:07/21/1996
FSC:7930
NIIN:00-993-6499
MSDS Number: CBTSG
=== Responsible Party ===
Company Name:DIHOMA CHEMICAL MANUFACURING, INC.
Address:ROUTE 3, BOX 375
City:MULLINS
State:SC
ZIP:29574
Country:US
Info Phone Num:803-423-7799
Emergency Phone Num:803-423-7799
CAGE:0FMP6

==== Contractor Identification ====
Company Name:DIHOMA CHEMICAL & MFG INC
Address:RT 3
Box:City:MULLINS
State:SC
ZIP:29574
Country:US
Phone:803-423-7799
CAGE:0FMP6

=====
===== Composition/Information on Ingredients =====

Ingred Name:350 CST. SILICON
CAS:63148-62-9
Fraction by Wt: 1-5%
Other REC Limits:NONE RECOMMENDED

Ingred Name:DOW CORNING 20 RELEASE
Fraction by Wt: 1-4%
Other REC Limits:NONE RECOMMENDED

Ingred Name:STODDARD SOLVENT 66-3
CAS:8052-41-3
RTECS #:WJ8925000
Fraction by Wt: 20.0%
Other REC Limits:NONE RECOMMENDED

Ingred Name:LAURIC ACID 96%
CAS:143-07-7
Fraction by Wt: 2.0%
Other REC Limits:NONE RECOMMENDED

Ingred Name:MORPHOLINE
CAS:110-91-8
RTECS #:QD6475000
Fraction by Wt: 1.0%
Other REC Limits:NONE RECOMMENDED

Ingred Name:AQUA AMMONIA
CAS:584-84-9
RTECS #:CZ6300000
Fraction by Wt: 1.0%
Other REC Limits:NONE RECOMMENDED
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS

Ingred Name:SOLVENT WATER
Fraction by Wt: 56-60%
Other REC Limits:NONE RECOMMENDED

Ingred Name:CARBOPOL 934
CAS:9003-01-4
RTECS #:AT4680000
Fraction by Wt: 0.2%
Other REC Limits:NONE RECOMMENDED

Ingred Name:SNOW FLOSS
Fraction by Wt: 14.0%
Other REC Limits:NONE RECOMMENDED

==== Hazards Identification =====

Routes of Entry: Inhalation:NO Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INGESTION: MAY CAUSE NAUSEA, VOMITING.
EYES: POSSIBLY IRRITATING TO EYES.

==== First Aid Measures =====

First Aid:INGESTION: DILUTE BY DRINKING COPIOUS AMOUNTS OF WATER & GET
MEDICAL AID. SKIN: WASH AFFECTED SKIN AREAS W/SOAP & WATER. EYES:
WASH W/LARGE AMOUNTS WATER AT LEAST 15 MINUTES. GET MEDICAL AID IF
REQUIR ED.

==== Fire Fighting Measures =====

Flash Point:NA
Extinguishing Media:PRODUCT IS NONFLAMMABLE AS SUPPLIED. USE WATER,
FOAM, CARBON DIOXIDE, DRY CHEMICAL TO EXTINGUISH FIRE.
Fire Fighting Procedures:WEAR SCBA FOR EXTINGUISHING ALL CHEMICAL
FIRES.
Unusual Fire/Explosion Hazard:NONFLAMMABLE AS SUPPLIED. DON'T DEPEND ON
AMBIENT AIR SUPPLY DURING FIRES. FIRE MAY RESULT INTO RELEASE OF
TOXIC GASES SUCH AS OXIDES OF CARBON/NITROGEN/SULFUR.

==== Accidental Release Measures =====

Spill Release Procedures:SOAK UP SPILLS W/ABSORBENT & SCOOP INTO DRUMS.
FOLLOW ALL LOCAL, STATE, FEDERAL REGULATIONS. DON'T DISCHARGE INTO
LAKES/STREAMS. FLOOR MAY BE SLIPPERY. USE CAUTION TO AVOID FALLS.

==== Handling and Storage =====

Handling and Storage Precautions:PH 8.5 GIVE OR TAKE .5

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NO SPECIAL PROTECTION REQUIRED
Ventilation:NO SPECIAL PROTECTION REQUIRED
Protective Gloves:NO SPECIAL PROTECTION REQUIRED
Eye Protection:NO SPECIAL PROTECTION REQUIRED
Supplemental Safety and Health
NK

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:212F,100C
Spec Gravity:1.01
Evaporation Rate & Reference:0.2-1.0
Solubility in Water:SLIGHT
Appearance and Odor:BROWN, THICK LIQUID, SLIGHT AMMONIA ODOR
Percent Volatiles by Volume:79.0

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
MINERAL ACIDS - SULFURIC, HYDROCHLORIC
Hazardous Decomposition Products:NONE

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Silver Sulfate

ACC# 20825

Section 1 - Chemical Product and Company Identification

MSDS Name: Silver Sulfate

Catalog Numbers: NC9259347, NC9564591, NC9565087, S190-100, S190-25, S190-500

Synonyms: None

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10294-26-5	Silver Sulfate	>98	233-653-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye irritation. May cause skin and respiratory tract irritation.

Target Organs: Eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation.

Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silver Sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Silver Sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: negligible

Viscosity: Not available.

Boiling Point: 1085 deg C

Freezing/Melting Point: 652.2 deg C

Decomposition Temperature: 1085 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 5.5

Molecular Formula: Ag₂O₄S

Molecular Weight: 311.79

Section 10 - Stability and Reactivity

Chemical Stability: Light sensitive.

Conditions to Avoid: Incompatible materials, light.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Oxides of sulfur, oxides of silver.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 10294-26-5 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10294-26-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information found

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10294-26-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10294-26-5: delayed.

Section 313

This material contains Silver Sulfate (listed as Silver compounds), >98%, (CAS# 10294-26-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 10294-26-5 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10294-26-5 can be found on the following state right to know lists: California, (listed as Silver compounds), New Jersey, (listed as Silver compounds), Pennsylvania, (listed as Silver compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

WGK (Water Danger/Protection)

CAS# 10294-26-5: 3

Canada - DSL/NDSL

CAS# 10294-26-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10294-26-5 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Silver Acetate

ACC# 20775

Section 1 - Chemical Product and Company Identification

MSDS Name: Silver Acetate

Catalog Numbers: S80163, S80163-1, S801631, S93350, S170 25, S170-25, S17025

Synonyms: Acetic Acid Silver (+1) Salt; Silver Monoacetate

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
563-63-3	Silver Acetate	app.100	209-254-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white solid.

Caution! Irritant. Causes eye and skin irritation. May cause respiratory tract irritation. May cause digestive tract irritation. Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation. May cause skin discoloration.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Causes gastrointestinal tract irritation. Causes digestive tract irritation.

Inhalation: Causes respiratory tract irritation. Can produce delayed pulmonary edema.

Chronic: Effects may be delayed. Chronic inhalation or ingestion of silver salts may cause argyria characterized by a permanent blue-gray discoloration of the eyes, skin, mucous membranes, and internal organs. This malady results from the accumulation of silver in the body.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silver Acetate	0.01 mg/m ³ TWA (as Ag) (listed under Silver soluble compounds).	0.01 mg/m ³ TWA (as Ag) (listed under Silver soluble compounds). 10 mg/m ³ IDLH (as Ag) (listed under Silver soluble compounds).	0.01 mg/m ³ TWA (listed under Silver soluble compounds).

OSHA Vacated PELs: Silver Acetate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to off-white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate:negligible
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:decomposes
Decomposition Temperature:Not available.
Solubility: moderately soluble in hot water
Specific Gravity/Density:3.26
Molecular Formula:C₂H₃AgO₂
Molecular Weight:166.888

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Light sensitive.

Conditions to Avoid: High temperatures, incompatible materials, light, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, direct light.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 563-63-3: AJ4100000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 563-63-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 563-63-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 563-63-3: immediate, delayed, fire.

Section 313

This material contains Silver Acetate (listed as Silver compounds), app.100%, (CAS#

563-63-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 563-63-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 563-63-3 can be found on the following state right to know lists: California, (listed as Silver compounds), Pennsylvania, (listed as Silver compounds), Minnesota, (listed as Silver soluble compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 563-63-3: 3

Canada - DSL/NDSL

CAS# 563-63-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 563-63-3 (listed as Silver soluble compounds) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Silver bromide, 99%

ACC# 67015

Section 1 - Chemical Product and Company Identification

MSDS Name: Silver bromide, 99%

Catalog Numbers: AC210410000, AC210410050, AC210410250

Synonyms: None

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7785-23-1	Silver bromide (agbr)	99.0	232-076-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Caution! Light sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. No information regarding eye irritation and other potential effects was found.

Skin: May cause skin irritation. No information regarding skin irritation and other potential effects was found.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep container closed when not in use.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silver bromide (agbr)	none listed	none listed	none listed

OSHA Vacated PELs: Silver bromide (agbr): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 700 deg C

Freezing/Melting Point: 432 deg C

Decomposition Temperature: Not available.

Solubility: IN WATER: 0.135 MG/L (25°C)

Specific Gravity/Density: 6.4730g/cm³

Molecular Formula: AgBr

Molecular Weight: 187.77

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: None reported.

Incompatibilities with Other Materials: None reported..

Hazardous Decomposition Products: None reported.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7785-23-1 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7785-23-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7785-23-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Silver bromide (agbr) (listed as Silver compounds), 99.0%, (CAS# 7785-23-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7785-23-1 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7785-23-1 can be found on the following state right to know lists: California, (listed as Silver compounds), New Jersey, (listed as Silver compounds), Pennsylvania, (listed as Silver compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7785-23-1: 1

Canada - DSL/NDSL

CAS# 7785-23-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7785-23-1 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Silver carbonate

ACC# 97221

Section 1 - Chemical Product and Company Identification

MSDS Name: Silver carbonate

Catalog Numbers: AC176970000, AC176970050, AC176970250, AC176971000, AC9540264

Synonyms: Carbonic acid, disilver(1+) salt.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
534-16-7	Silver carbonate	99	208-590-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow powder.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: Chronic inhalation or ingestion of silver salts may cause argyria characterized by a permanent blue-gray discoloration of the eyes, skin, mucous membranes, and internal organs. This malady results from the accumulation of silver in the body.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silver carbonate	none listed	none listed	none listed

OSHA Vacated PELs: Silver carbonate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: green - yellow

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 210 deg C(decom)

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: Not available.

Molecular Formula: CAg_2O_3

Molecular Weight: 275.75

Section 10 - Stability and Reactivity

Chemical Stability: Light sensitive.

Conditions to Avoid: Incompatible materials, light, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, acids.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, oxides of silver.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 534-16-7: FG0700000

LD50/LC50:

CAS# 534-16-7:

Oral, mouse: LD50 = 2168 mg/kg;

Oral, rat: LD50 = 3731 mg/kg;

Carcinogenicity:

CAS# 534-16-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 534-16-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 534-16-7: delayed.

Section 313

This material contains Silver carbonate (listed as Silver compounds), 99%, (CAS# 534-16-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 534-16-7 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 534-16-7 can be found on the following state right to know lists: California, (listed as Silver compounds), New Jersey, (listed as Silver compounds), Pennsylvania, (listed as Silver compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 534-16-7: 1

Canada - DSL/NDSL

CAS# 534-16-7 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 534-16-7 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Silver Chloride

ACC# 20787

Section 1 - Chemical Product and Company Identification

MSDS Name: Silver Chloride

Catalog Numbers: S174-100

Synonyms: Silver Monochloride; Chlorous Acid, Silver Salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7783-90-6	Silver chloride	100	232-033-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes respiratory tract irritation. May cause eye and skin irritation. May cause digestive tract irritation with nausea, vomiting, and diarrhea. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

Target Organs: Blood.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause mild skin irritation. May cause cyanosis of the extremities.

Ingestion: May cause irritation of the digestive tract. Ingestion of soluble silver salts may cause argyria, characterized by permanent blue-gray pigmentation of the skin, mucous membranes, and eyes. Ingestion of silver compounds may cause abdominal pain, rigidity,

convulsions and shock.

Inhalation: Causes respiratory tract irritation.

Chronic: Chronic inhalation or ingestion of silver salts may cause argyria characterized by a permanent blue-gray discoloration of the eyes, skin, mucous membranes, and internal organs. This malady results from the accumulation of silver in the body. Chronic overexposure to silver compounds may cause argyria (a slate gray or bluish discoloration of the skin and deep tissues due to the deposit of insoluble albuminate of silver).

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of a metal chelator should be determined only by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep away from sources of ignition. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silver chloride	none listed	none listed	none listed

OSHA Vacated PELs: Silver chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 1550 deg C
Freezing/Melting Point:455 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble in water.
Specific Gravity/Density:5.56
Molecular Formula:AgCl
Molecular Weight:143.3212

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Ammonia, aluminum, bromine trifluoride, potassium sodium, and sodium peroxide+ charcoal.

Hazardous Decomposition Products: Chlorine, silver fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7783-90-6: VW3563000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7783-90-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7783-90-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7783-90-6: delayed.

Section 313

This material contains Silver chloride (listed as Silver compounds), 100%, (CAS# 7783-90-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7783-90-6 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7783-90-6 can be found on the following state right to know lists: California, (listed as Silver compounds), New Jersey, (listed as Silver compounds), Pennsylvania, (listed as Silver compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 37 Irritating to respiratory system.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7783-90-6: 1

Canada - DSL/NDSL

CAS# 7783-90-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7783-90-6 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Silver Iodide

ACC# 20805

Section 1 - Chemical Product and Company Identification

MSDS Name: Silver Iodide

Catalog Numbers: S178-100

Synonyms: None

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7783-96-2	Silver Iodide	>98	232-038-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light yellow solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Light sensitive. May cause reproductive and fetal effects. The toxicological properties of this material have not been fully investigated.

Target Organs: Thyroid.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Can cause eczema and rash.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation. May cause effects similar to those described for ingestion. The toxicological properties of this substance have not been fully investigated.

Chronic: Chronic inhalation or ingestion of silver salts may cause argyria characterized by a permanent blue-gray discoloration of the eyes, skin, mucous membranes, and internal organs. This malady results from the accumulation of silver in the body. Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn. Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms could include skin rash, running nose and headache.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Store protected from light.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silver Iodide	none listed	none listed	none listed

OSHA Vacated PELs: Silver Iodide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: light yellow
Odor: none reported
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate:negligible
Viscosity: Not available.
Boiling Point: Not applicable.
Freezing/Melting Point:552.2 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble in water.
Specific Gravity/Density:5.68 @ 30°C
Molecular Formula:AgI
Molecular Weight:234.7727

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, incompatible materials, light, dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Irritating and toxic fumes and gases, hydrogen iodide.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 7783-96-2: VW4450000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7783-96-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7783-96-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7783-96-2: delayed.

Section 313

This material contains Silver Iodide (listed as Silver compounds), >98%, (CAS# 7783-96-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7783-96-2 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7783-96-2 can be found on the following state right to know lists: California, (listed as Silver compounds), New Jersey, (listed as Silver compounds), Pennsylvania, (listed as Silver compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 7783-96-2: 1

Canada - DSL/NDSL

CAS# 7783-96-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7783-96-2 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Silver Oxide

ACC# 20819

Section 1 - Chemical Product and Company Identification

MSDS Name: Silver Oxide

Catalog Numbers: S80165, S184-100

Synonyms: Argentous oxide

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
20667-12-3	Silver oxide (Ag ₂ O)	100	243-957-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown-black solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Harmful if swallowed. Causes severe respiratory tract irritation. May cause severe skin irritation and possible burns. Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

Target Organs: None.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: May cause severe irritation and possible burns.

Ingestion: Harmful if swallowed. May cause severe gastrointestinal tract irritation with

nausea, vomiting and possible burns.

Inhalation: May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema.

Chronic: Chronic inhalation can cause pneumoconiosis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None.

Section 5 - Fire Fighting Measures

General Information: Strong oxidizer. Contact with other material may cause fire. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Do not ingest or inhale. Do not store near combustible materials.

Storage: Keep away from sources of ignition. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Silver oxide (Ag ₂ O)	none listed	none listed	none listed

OSHA Vacated PELs: Silver oxide (Ag₂O): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear impervious gloves.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: brown-black

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 392 deg F

Decomposition Temperature: Not available.

Solubility: Negligible in water.
Specific Gravity/Density: 7.14
Molecular Formula: Ag₂O
Molecular Weight: 231.7358

Section 10 - Stability and Reactivity

Chemical Stability: Stable. Absorbs carbon dioxide from the air.
Conditions to Avoid: Incompatible materials, combustible materials, organic materials, reducing agents.
Incompatibilities with Other Materials: Reacts dangerously with ammonia. Grinding silver oxide with metal sulfides, selenium, sulfur, or phosphorus can cause ignition. Hydrogen sulfide may ignite when in contact with silver oxide. Incompatible with hydrazines, amines, sulfur, metal sulfides, and carbon monoxide.
Hazardous Decomposition Products: Oxygen, silver fumes.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 20667-12-3: VW4900000
LD50/LC50:
CAS# 20667-12-3:
Oral, mouse: LD50 = 1027 mg/kg;
Oral, rat: LD50 = 2820 mg/kg;

Carcinogenicity:
CAS# 20667-12-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, N.O.S.	No information available.
Hazard Class:	5.1	
UN Number:	UN1479	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 20667-12-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 20667-12-3: immediate, delayed, fire.

Section 313

This material contains Silver oxide (Ag₂O) (listed as Silver compounds), 100%, (CAS# 20667-12-3) which is subject to the reporting requirements of Section 313 of SARA Title III

and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 20667-12-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 20667-12-3 can be found on the following state right to know lists: California, (listed as Silver compounds), Pennsylvania, (listed as Silver compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36/38 Irritating to eyes and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 22 Do not breathe dust.

S 24/25 Avoid contact with skin and eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 20667-12-3: 1

Canada - DSL/NDSL

CAS# 20667-12-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 20667-12-3 is not listed on the Canadian Ingredient Disclosure List.

DIHOMA CHEMICAL MANUFACTURING, INC. -- SILVER METAL POLISH -- 7930-00-993-6499

=====
===== Product Identification =====

Product ID:SILVER METAL POLISH
MSDS Date:07/21/1996
FSC:7930
NIIN:00-993-6499
MSDS Number: CBTSG
=== Responsible Party ===
Company Name:DIHOMA CHEMICAL MANUFACTURING, INC.
Address:ROUTE 3, BOX 375
City:MULLINS
State:SC
ZIP:29574
Country:US
Info Phone Num:803-423-7799
Emergency Phone Num:803-423-7799
CAGE:0FMP6

==== Contractor Identification ====
Company Name:DIHOMA CHEMICAL & MFG INC
Address:RT 3
Box:City:MULLINS
State:SC
ZIP:29574
Country:US
Phone:803-423-7799
CAGE:0FMP6

=====
===== Composition/Information on Ingredients =====

Ingred Name:350 CST. SILICON
CAS:63148-62-9
Fraction by Wt: 1-5%
Other REC Limits:NONE RECOMMENDED

Ingred Name:DOW CORNING 20 RELEASE
Fraction by Wt: 1-4%
Other REC Limits:NONE RECOMMENDED

Ingred Name:STODDARD SOLVENT 66-3
CAS:8052-41-3
RTECS #:WJ8925000
Fraction by Wt: 20.0%
Other REC Limits:NONE RECOMMENDED

Ingred Name:LAURIC ACID 96%
CAS:143-07-7
Fraction by Wt: 2.0%
Other REC Limits:NONE RECOMMENDED

Ingred Name:MORPHOLINE
CAS:110-91-8
RTECS #:QD6475000
Fraction by Wt: 1.0%
Other REC Limits:NONE RECOMMENDED

Ingred Name:AQUA AMMONIA
CAS:584-84-9
RTECS #:CZ6300000
Fraction by Wt: 1.0%
Other REC Limits:NONE RECOMMENDED
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS

Ingred Name:SOLVENT WATER
Fraction by Wt: 56-60%
Other REC Limits:NONE RECOMMENDED

Ingred Name:CARBOPOL 934
CAS:9003-01-4
RTECS #:AT4680000
Fraction by Wt: 0.2%
Other REC Limits:NONE RECOMMENDED

Ingred Name:SNOW FLOSS
Fraction by Wt: 14.0%
Other REC Limits:NONE RECOMMENDED

=====
===== Hazards Identification =====
=====

Routes of Entry: Inhalation:NO Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INGESTION: MAY CAUSE NAUSEA, VOMITING.
EYES: POSSIBLY IRRITATING TO EYES.

=====
===== First Aid Measures =====
=====

First Aid:INGESTION: DILUTE BY DRINKING COPIOUS AMOUNTS OF WATER & GET
MEDICAL AID. SKIN: WASH AFFECTED SKIN AREAS W/SOAP & WATER. EYES:
WASH W/LARGE AMOUNTS WATER AT LEAST 15 MINUTES. GET MEDICAL AID IF
REQUIR ED.

=====
===== Fire Fighting Measures =====
=====

Flash Point:NA
Extinguishing Media:PRODUCT IS NONFLAMMABLE AS SUPPLIED. USE WATER,
FOAM, CARBON DIOXIDE, DRY CHEMICAL TO EXTINGUISH FIRE.
Fire Fighting Procedures:WEAR SCBA FOR EXTINGUISHING ALL CHEMICAL
FIRES.
Unusual Fire/Explosion Hazard:NONFLAMMABLE AS SUPPLIED. DON'T DEPEND ON
AMBIENT AIR SUPPLY DURING FIRES. FIRE MAY RESULT INTO RELEASE OF
TOXIC GASES SUCH AS OXIDES OF CARBON/NITROGEN/SULFUR.

=====
===== Accidental Release Measures =====
=====

Spill Release Procedures:SOAK UP SPILLS W/ABSORBENT & SCOOP INTO DRUMS.
FOLLOW ALL LOCAL, STATE, FEDERAL REGULATIONS. DON'T DISCHARGE INTO
LAKES/STREAMS. FLOOR MAY BE SLIPPERY. USE CAUTION TO AVOID FALLS.

=====
===== Handling and Storage =====
=====

Handling and Storage Precautions:PH 8.5 GIVE OR TAKE .5

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NO SPECIAL PROTECTION REQUIRED
Ventilation:NO SPECIAL PROTECTION REQUIRED
Protective Gloves:NO SPECIAL PROTECTION REQUIRED
Eye Protection:NO SPECIAL PROTECTION REQUIRED
Supplemental Safety and Health
NK

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:212F,100C
Spec Gravity:1.01
Evaporation Rate & Reference:0.2-1.0
Solubility in Water:SLIGHT
Appearance and Odor:BROWN, THICK LIQUID, SLIGHT AMMONIA ODOR
Percent Volatiles by Volume:79.0

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
MINERAL ACIDS - SULFURIC, HYDROCHLORIC
Hazardous Decomposition Products:NONE

Disclaimer (provided with this information by the compiling agencies):
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of Defense. The United States of America in no manner whatsoever,
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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Sodium ammonium phosphate tetrahydrate

ACC# 20905

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium ammonium phosphate tetrahydrate

Catalog Numbers: 61164-5000, S218-500

Synonyms: Ammonium sodium phosphate tetrahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7783-13-3	Sodium ammonium phosphate tetrahydrate	>99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless solid.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Prolonged or repeated skin contact may cause dermatitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium ammonium phosphate tetrahydrate	none listed	none listed	none listed
Phosphoric acid, monoammonium monosodium salt anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Sodium ammonium phosphate tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Phosphoric acid, monoammonium monosodium salt anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless

Odor: odorless

pH: 8 (5% solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: 79 deg C

Decomposition Temperature: Not available.

Solubility: soluble in water

Specific Gravity/Density:1.54
Molecular Formula:H5NNaO4P.4H2O
Molecular Weight:209.07

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, dust generation.

Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants..

Hazardous Decomposition Products: Oxides of nitrogen, oxides of phosphorus, ammonia and/or derivatives.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7783-13-3 unlisted.

CAS# 13011-54-6 unlisted.

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 7783-13-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 13011-54-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No data available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: When too many nutrients such as phosphorus are in the water, algae grows

maniacally. Algae blooms are followed by a die-off, and as material decays, it consumes oxygen like a forest fire. No fish, plants or insects can live in oxygen-free zones.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7783-13-3 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 13011-54-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7783-13-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 13011-54-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7783-13-3: No information available.

CAS# 13011-54-6: No information available.

Canada - DSL/NDSL

CAS# 13011-54-6 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sodium azide

ACC# 20960

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium azide

Catalog Numbers: AC190380000, AC190380050, AC190385000, 19038-1000, BP922I-500, NC9812538, S227I-1, S227I-100, S227I-25, S227I-500, S227I-500LC

Synonyms: Sodium salt of hydrazoic acid; Smite; Azium.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
26628-22-8	Sodium azide	99+	247-852-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Danger! May be fatal if inhaled, absorbed through the skin or swallowed. Reacts with many heavy metals to form explosive compounds. Heating may cause an explosion. Causes eye, skin, and respiratory tract irritation. Contact with acids liberates toxic gas. Readily absorbed through the skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Target Organs: Blood, kidneys, heart, central nervous system, liver, spleen, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Contact with dust or vapor may cause systemic toxic

Skin: Causes skin irritation. May be fatal if absorbed through the skin. Substance is readily absorbed through the skin.

Ingestion: May be fatal if swallowed. May cause irritation of the digestive tract. May cause low blood pressure, rapid heartbeat, skin discoloration, and possible coma.

Inhalation: May be fatal if inhaled. May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. The vapor of hydrazoic acid may be present where sodium azide is handled. Symptoms of acute exposure to hydrazoic acid include eye irritation, headache, dramatic decrease in blood pressure, weakness, pulmonary edema, and collapse.

Chronic: May cause liver and kidney damage. Repeated exposure may cause damage to the spleen. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects. Animal studies have reported the development of tumors.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. SPEEDY ACTION IS CRITICAL!

Ingestion: POISON material. If swallowed, get medical aid immediately. Only induce vomiting if directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. SPEED IS ESSENTIAL, OBTAIN MEDICAL AID IMMEDIATELY. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Containers may explode in the heat of a fire. Forms explosion sensitive compounds with some metals such as lead and copper. Form hydrazoic acid vapor in contact with acid or water. Hydrazoic acid vapor is highly toxic and a dangerous explosive. Hydrazoic acid is shock sensitive.

Extinguishing Media: Do NOT use water directly on fire. Use dry chemical.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 4; Flammability: 0; Instability: 2

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Evacuate unnecessary personnel. Do not flush down the drain. Over a period of time, sodium azide may react with copper, lead, brass, or solder in plumbing systems to form an accumulation of the highly explosive compounds of lead azide and copper azide. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood. Acids should not be used around this material unless absolutely necessary and then only after careful planning. Contact with acids liberates toxic gas.

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep away from acids. Do not store in metal containers.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium azide	0.29 mg/m ³ Ceiling (as NaN ₃); 0.11 ppm Ceiling (vapor, as hydrazoic acid)	none listed	none listed
Hydrazoic acid	none listed	none listed	none listed

OSHA Vacated PELs: Sodium azide: No OSHA Vacated PELs are listed for this chemical. Hydrazoic acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 10 (1M aq.sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 300 deg C @ 760 mmHg

Freezing/Melting Point: 275 deg C (decom)

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 1.850

Molecular Formula: N₃Na

Molecular Weight: 65.01

Section 10 - Stability and Reactivity

Chemical Stability: Heating may cause an explosion. Contact with acid liberates gas. Heat sensitive

Conditions to Avoid: Incompatible materials, dust generation, moisture, metals, strong acids, temperatures above 250°C.

Incompatibilities with Other Materials: Acids, metals, halogenated hydrocarbons, acid chlorides.

Hazardous Decomposition Products: Nitrogen oxides, sodium oxide, hydrazoic acid.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 26628-22-8: VY8050000

CAS# 7782-79-8: MW2800000

LD50/LC50:

CAS# 26628-22-8:

Inhalation, mouse: LC50 = 32400 ug/m³;

Inhalation, rat: LC50 = 37 mg/m³;

Oral, mouse: LD50 = 27 mg/kg;

Oral, rat: LD50 = 27 mg/kg;

Skin, rabbit: LD50 = 20 mg/kg;

Skin, rat: LD50 = 50 mg/kg;

CAS# 7782-79-8:

Inhalation, mouse: LC50 = 34 mg/m³;

Oral, rat: LD50 = 33 mg/kg;

Carcinogenicity:

CAS# 26628-22-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7782-79-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Tumorigenic effects have been reported in experimental animals.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.8-1.6 mg/L; 96 Hr.; 13 degrees C Fish:

Bluegill/Sunfish: LC50 = 0.7-0.8 mg/L; 96 Hr.; 18 degrees C No data available.

Environmental: Aquatic Fate: Photolysis of sodium azide may result in metal nitrides initially, with the eventual formation of the free metal and nitrogen gas.

Physical: No information available.

Other: Harmful to aquatic life in very low concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: CAS# 26628-22-8: waste number P105.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	SODIUM AZIDE	SODIUM AZIDE
Hazard Class:	6.1	6.1
UN Number:	UN1687	UN1687
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 26628-22-8 is listed on the TSCA inventory.

CAS# 7782-79-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 26628-22-8: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 26628-22-8: 500 lb TPQ (This material is a reactive solid. The TPQ does not default to 10000 pounds for non-powder, non-molten, non-solvent form)

SARA Codes

CAS # 26628-22-8: immediate, delayed, reactive.

Section 313

This material contains Sodium azide (CAS# 26628-22-8, 99+%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 26628-22-8 can be found on the following state right to know lists: California,

New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7782-79-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T+ N

Risk Phrases:

R 28 Very toxic if swallowed.

R 32 Contact with acids liberates very toxic gas.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 28A After contact with skin, wash immediately with plenty of water

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 26628-22-8: 2

CAS# 7782-79-8: No information available.

Canada - DSL/NDSL

CAS# 26628-22-8 is listed on Canada's DSL List.

CAS# 7782-79-8 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, D2B, F.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 26628-22-8 is listed on the Canadian Ingredient Disclosure List.

CAS# 7782-79-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium Acetate, Anhydrous

ACC# 20860

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Acetate, Anhydrous

Catalog Numbers: AC149610000, AC149610010, AC149610025, AC220890000, AC220890010, AC220890050, AC220892500, AC327290000, AC327290010, AC419410000, AC419415000, AC424250000, AC424250050, 42425-5000, BP333-1, BP333-500, NC9599353, NC9714437, S210-2, S210-500

Synonyms: Acetic Acid, Sodium Salt; Sodium Acetate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
127-09-3	Sodium acetate	100.0	204-823-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None known.

Potential Health Effects

Eye: May cause mild eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Get medical aid. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: None

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not available.

Autoignition Temperature: 607 deg C (1,124.60 deg F)

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium acetate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium acetate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless to slight acetic-like odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 324 deg C

Decomposition Temperature: Not available.

Solubility: 1190 g/l (20 C)

Specific Gravity/Density: Not available.

Molecular Formula: C₂H₃O₂Na

Molecular Weight: 82.03

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents. Explosive mixtures may be formed with fluorine or potassium nitrite.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 127-09-3: AJ4300010

LD50/LC50:

CAS# 127-09-3:

Draize test, rabbit, eye: 10 mg Mild;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = >30 gm/m³/1H;

Oral, mouse: LD50 = 6891 mg/kg;

Oral, rat: LD50 = 3530 mg/kg;

Skin, rabbit: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 127-09-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 5000 mg/L; 24 Hr.; Unspecified Water flea

Daphnia: EC50 = 5800 mg/L; 48 Hr.; Unspecified Acute aquatic effects: 96-hour LC50 for fathead minnow: GT 100mg/L, 96-hour LC50 for water flea: GT 1000mg/L. This chemical has a low potential to affect aquatic organisms.

Environmental: This chemical is readily biodegradable and is not likely to bioconcentrate.

Physical: None.

Other: This chemical has a high biological oxygen demand, and it is expected to cause significant oxygen depletion in aquatic systems.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 127-09-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 127-09-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 127-09-3: 1

Canada - DSL/NDSL

CAS# 127-09-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

ALDRICH CHEMICAL CO INC -- SODIUM ARSENATE, DIBASIC HEPTAHYDRATE,
27185-3 -- 6810-00N062196

=====
Product Identification
=====

Product ID:SODIUM ARSENATE, DIBASIC HEPTAHYDRATE, 27185-3
MSDS Date:08/17/1994
FSC:6810
NIIN:00N062196
MSDS Number: BYSTR
=== Responsible Party ===
Company Name:ALDRICH CHEMICAL CO INC
Box:355
City:MILWAUKEE
State:WI
ZIP:53201
Country:US
Info Phone Num:414-273-3850
Emergency Phone Num:414-273-3850
CAGE:60928

==== Contractor Identification ====
Company Name:ALDRICH CHEMICAL CO INC
Address:1001 WEST ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:60928

=====
Composition/Information on Ingredients
=====

Ingred Name:ARSENIC ACID, DISODIUM SALT, HEPTAHYDRATE; (SODIUM
ARSENATE, DIBASIC HEPTAHYDRATE (SARA 313) (CERCLA)
CAS:10048-95-0
RTECS #:CG0900000
OSHA PEL:SEE 1910.1018
ACGIH TLV:0.01 MG/M3, A1

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:YES IARC:NO OSHA:YES
Health Hazards Acute and Chronic:TARGET ORGANS:SKIN, LUNGS. ACUTE:MAY
BE FATAL IF INHALED, SWALLOWED, OR ABSORBED THROUGH SKIN. CAUSES
EYE AND SKIN IRRITATION. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES
AND UPPER RESPIRATORY TRACT. C AUSES DERMATITIS.
CHRONIC:CARCINOGEN.
Explanation of Carcinogenicity:ARSENIC ACID:NTP 7TH ANN RPT ON CARCINS,
1994:KNOWN TO BE CARCIN. OSHA CFR VOL 29, PG 1910.1018, 1987-CANCER
HAZARD.
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:EYES & SKIN:IMMED FLUSH EYES OR SKIN WITH COPIOUS AMTS OF WATER FOR @ LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLTHG & SHOES. INHAL:REMOVE TO FRESH AIR. IF NOT BRTHG, GIVE ARTF RESP. IF BRTHG IS D FCLT, GIVE OXYG. INGEST:WASH OUT MOUTH W/WATER PROVIDED PERSON IS CONSCIOUS. CALL PHYS IMMED. DISCARD CONTAMD CLTHG & SHOES.

===== Fire Fighting Measures =====

Extinguishing Media:NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR NIOSH/MSHA APPRVD SCBA, RUBB BOOTS & HEAVY RUBB GLOVES. SWEEP UP, PLACE IN BAG & HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA & WASH SPILL SITE AFTER MATL PICKUP IS COMPLETE.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:HIGHLY TOX. VERY TOX BY INHAL, IN CONT W/SKIN & IF SWALLOWED. IRRIT TO EYES, RESP SYS & SKIN. DANGER:CONTNS INORGANIC ARSENIC. CANCER HAZARD.

Other Precautions:HARMFUL IF INHAL/SWALLOWED. USE ONLY W/ADEQ VENT/RESP PROT. DO NOT BREATHE DUST. DO NOT GET IN EYES, ON SKIN, ON CLTHG. AVOID PRLNGD/RPTD EXPOS. IRRITANT. KEEP TIGHTLY CLSD. HYGROSCOPIC. STORE IN COOL DRY PLACE.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .

Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.

Protective Gloves:CHEMICAL-RESISTANT GLOVES.

Eye Protection:ANSI APPRVD CHEM WORKERS GOGGLES .

Other Protective Equipment:ANSI APPRVD EMERGENCY EYE WASH & DELUGE SHOWER .

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

Evaporation Rate & Reference:NOT KNOWN

Solubility in Water:NOT KNOWN

Appearance and Odor:WHITE CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

STRONG OXIDIZING AGENTS, STRONG ACIDS, ABSORBS CO*2 FROM AIR.

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:TOXIC FUMES OF:ARSENIC OXIDES.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL
REGULATIONS .

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Sodium arsenite, powder, certified

ACC# 21360

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium arsenite, powder, certified

Catalog Numbers: S225I-100, S225I-500

Synonyms: Arsenenous acid, sodium salt; Sodium metaarsenite; Sodium arsenite; Sodium dioxoarsenate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7784-46-5	Sodium arsenite	100	232-070-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to gray white solid.

Danger! May be fatal if swallowed. May be fatal if absorbed through the skin. Harmful if inhaled. Contains inorganic arsenic. Causes eye, skin, and respiratory tract irritation. Cancer hazard.

Target Organs: Lungs, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be fatal if absorbed through the skin. Exposure to arsenic compounds may produce hyperpigmentation of the skin and hyperkeratoses of plantar and palmar surfaces as well as both primary irritation and sensitization types.

Ingestion: May be fatal if swallowed. Poison by ingestion. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. All soluble arsenic (As) compounds are considered to be poisonous to humans. Inorganic arsenic is more toxic than organic arsenic. Organic arsenic is excreted more rapidly than inorganic arsenic. Arsenic 5+ is excreted more rapidly than arsenic 3+.

Inhalation: Causes respiratory tract irritation. Inhalation of arsenic compounds may lead to irritation of the respiratory tract and to possible nasal perforation. Long-term exposure to arsenic compounds may produce impairment of peripheral circulation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Inorganic arsenic compounds may cause skin and lung cancers in humans.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Evacuate unnecessary personnel. U.S. regulations require reporting spills and releases to soil, water and air in excess of reportable quantities. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get in eyes, on skin, or on clothing. Do not breathe dust. Use only with adequate ventilation or respiratory protection. Change contaminated clothing promptly. Do not take working clothes home.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. See 29CFR 1910.1018 for regulatory requirements pertaining to all occupational exposures to inorganic arsenic.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium arsenite	0.01 mg/m ³ TWA (as As) (listed under Arsenic, inorganic compounds).	5 mg/m ³ IDLH (as As) (listed under Arsenic, inorganic compounds).	10 æg/m ³ TWA (as As) (listed under Arsenic, inorganic compounds).5 æg/m ³ Action Level (as As); 10 æg/m ³ TWA (as As, Cancer hazard - see 29 CFR 19 10.1018, except Arsine) (listed under Arsenic, inorganic compounds).

OSHA Vacated PELs: Sodium arsenite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to gray white

Odor: odorless

pH: basic in solution

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Decomposes

Freezing/Melting Point: 615 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 1.87

Molecular Formula: NaAsO₂

Molecular Weight: 129.91

Section 10 - Stability and Reactivity

Chemical Stability: Stable. Absorbs carbon dioxide from the air.

Conditions to Avoid: Moisture, extreme temperatures.

Incompatibilities with Other Materials: Strong acids.

Hazardous Decomposition Products: Oxides of arsenic.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7784-46-5: CG3675000

LD50/LC50:

CAS# 7784-46-5:

Oral, rat: LD50 = 41 mg/kg;

Skin, rat: LD50 = 150 mg/kg;

Carcinogenicity:

CAS# 7784-46-5:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Arsenic, inorganic compounds').
- **California:** carcinogen, initial date 2/27/87 (listed as Arsenic, inorganic compounds).
- **NTP:** Known carcinogen (listed as Arsenic, inorganic compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: Epidemiological studies have demonstrated evidence of a causal relationship between environmental, occupational, and medicinal exposure of humans to inorganic arsenic and cancer of the skin and lungs.

Teratogenicity: Has caused teratogenic effects in animal studies.

Reproductive Effects: Can cause reproductive effects in animal studies.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: See actual entry in RTECS for complete information.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Arsenic compounds tend to be accumulated by oysters and other shellfish.

Environmental: No information available.

Physical: No information available.

Other: May be toxic to aquatic organisms; May cause long-term adverse effects in the aquatic environment.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	SODIUM ARSENITE, SOLID	SODIUM ARSENITE, SOLID

Hazard Class:	6.1	6.1
UN Number:	UN2027	UN2027
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-46-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7784-46-5: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 7784-46-5: 500 lb lower threshold TPO; 10000 lb upper threshold TPO

SARA Codes

CAS # 7784-46-5: immediate, delayed.

Section 313

This material contains Sodium arsenite (listed as Arsenic, inorganic compounds), 100%, (CAS# 7784-46-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7784-46-5 (listed as Arsenic, inorganic compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7784-46-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

CAS# 7784-46-5 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7784-46-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Arsenic, inorganic compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Sodium arsenite, listed as 'Arsenic, inorganic compounds',

a chemical known to the state of California to cause cancer.
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 23/25 Toxic by inhalation and if swallowed.

R 45 May cause cancer.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 20/21 When using do not eat, drink or smoke.

S 28 After contact with skin, wash immediately with...

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7784-46-5: 3

Canada - DSL/NDSL

CAS# 7784-46-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, D2A, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7784-46-5 is listed on the Canadian Ingredient Disclosure List.

CHEMETRICS INC -- SODIUM BORATE, DECAHYDRATE -- 6550-00F030808

===== Product Identification =====

Product ID:SODIUM BORATE, DECAHYDRATE
MSDS Date:12/17/1991
FSC:6550
NIIN:00F030808
Kit Part:Y
MSDS Number: BSLWZ
=== Responsible Party ===
Company Name:CHEMETRICS INC
Address:RT 28
City:CALVERTON
State:VA
ZIP:22016
Country:US
Info Phone Num:800-356-3072/703-788-9026
Emergency Phone Num:800-356-3072/703-788-9026
Preparer's Name:HENRY B. CASTANEDA
CAGE:7K791

=== Contractor Identification ===

Company Name:CHEMETRICS INC
Address:ROUTE 28
Box:City:CALVERTON
State:VA
ZIP:22016
Country:US
Phone:800-356-3072; 540-788-9026
CAGE:7K791

===== Composition/Information on Ingredients =====

Ingred Name:SODIUM TETRABORATE DECAHYDRATE, SODIUM BORATE, BORAX,
ANHYDROUS BORAX
CAS:1303-96-4
RTECS #:VZ2275000
ACGIH TLV:5 MG/CUM

===== Hazards Identification =====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:MUCOUS MEMBRANE IRRITANT. EYES:
CONJUNCTIVITIS.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:SKIN: RASH, MILD DIARRHEA, & VOMITING.
INGESTION: VOMITING & DIARRHEA.

===== First Aid Measures =====

First Aid:SKIN: WASH W/SOAP OR MILD DETERGENT & PLENTY OF WATER. EYES:
FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MINS. INGESTION: IF
CONSCIOUS & NOT CONVULSIVE, GIVE PLENTY OF WATER. OBTAIN MEDICAL
ATTENTION IN A LL CASES.

===== Fire Fighting Measures =====

Flash Point:NON-COMBUSTIBLE
Extinguishing Media:DRY CHEMICAL, CO2, WATER SPRAY OR FOAM
Unusual Fire/Explosion Hazard:MAY RELEASE TOXIC FUMES OF SODIUM
DIOXIDE.

===== Accidental Release Measures =====

Spill Release Procedures:DON'T TOUCH MATERIAL. TAKE UP W/SAND OR OTHER
ABSORBENT MATERIAL & PLACE INTO SMALL CONTAINERS FOR DISPOSAL.

===== Exposure Controls/Personal Protection =====

Ventilation:ADEQUATE
Protective Gloves:REQUIRED
Eye Protection:SAFETY GLASSES
Supplemental Safety and Health
MOLECULAR WEIGHT: 381.42

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:167F/75C
Spec Gravity:1.73
Solubility in Water:MODERATE
Appearance and Odor:SOLID WHITE POWDER OR CRYSTALS, ODORLESS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE, &
FEDERAL REGULATIONS.

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disclaims all liability for its use. Any person utilizing this
document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Sodium Carbonate Standard

ACC# 88058

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Carbonate Standard

Catalog Numbers: MCC-030460

Synonyms: Crystal Carbonate; Disodium Carbonate; Sal Soda; Soda Ash; Washing Soda

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	98.2	231-791-2
497-19-8	Sodium carbonate anhydrous	1.8	207-838-8

Hazard Symbols: XI

Risk Phrases: 36

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: almost colorless liquid. May cause eye and skin irritation with possible burns.

Caution! May cause respiratory tract irritation.

Target Organs: None.

Potential Health Effects

Eye: May result in corneal injury. Contact with eyes may cause severe irritation, and possible eye burns.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or

moist.

Ingestion: May cause irritation of the digestive tract.

Inhalation: Harmful if inhaled. May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema.

Chronic: Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Use water fog, dry chemical, carbon dioxide or alcohol type foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Cover with material such as dry soda ash or calcium carbonate and place into a closed container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Sodium carbonate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Sodium carbonate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves and clothing to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: almost colorless

Odor: odorless
pH: 11.6 (solution)
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 400 deg C
Freezing/Melting Point: 851 deg C
Decomposition Temperature: 400 deg C
Solubility: Soluble in water
Specific Gravity/Density: 1.55
Molecular Formula: Solution
Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Reacts explosively with red-hot aluminum metal. Incompatible with ammonia + silver nitrate, 2,4-dinitrotoluene, 2,4,6-trinitrotoluene, sulfuric acid, sodium sulfide + water, lithium, phosphorus pentoxide, fluorine, and hydrogen peroxide. Hot concentrated solutions of sodium carbonate are mildly corrosive to steel.

Hazardous Decomposition Products: Carbon dioxide, toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 497-19-8: VZ4050000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg; <BR.

CAS# 497-19-8:

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, eye: 50 mg Severe;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, mouse: LC50 = 1200 mg/m³/2H;

Inhalation, rat: LC50 = 2300 mg/m³/2H;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, rat: LD50 = 4090 mg/kg; <BR.

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 497-19-8: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 320 mg/L; 96 Hr.; Static Conditions Cas# 497-19-8

Environmental: No information reported.

Physical: No information found

Other: No information found

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 497-19-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 497-19-8: acute.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 497-19-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately

with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 497-19-8: 1

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 497-19-8 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

Canadian Ingredient Disclosure List

CAS# 497-19-8 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

Material Safety Data Sheet

Sodium Citrate Dihydrate

ACC# 21135

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Citrate Dihydrate

Catalog Numbers: BP327-1, BP327-500, NC9561807, NC9561811, NC9561812, NC9561815, NC9561817, NC9561818, NC9996793, S279-10, S279-10LC, S279-275LB, S279-3, S279-50, S279-500, S279-500LC, S279-50KB, S466-3, S466-3LC, S467-3, S467SAM-1, S470-12, S470-12LC, S470-212, S470-212LC

Synonyms: 2-Hydroxy-1,2,3-Propanetricarboxylic Acid Trisodium Salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6132-04-3	Trisodium citrate dihydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.
Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Trisodium citrate dihydrate	none listed	none listed	none listed
Trisodium citrate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Trisodium citrate dihydrate: No OSHA Vacated PELs are listed for this chemical. Trisodium citrate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 7.0-9.0 (5% solution)
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 313.9 deg C
Decomposition Temperature: Not available.
Solubility: Soluble in water
Specific Gravity/Density: 1.665
Molecular Formula: Na₃C₆H₅O₇·2H₂O
Molecular Weight: 294.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6132-04-3 unlisted.

CAS# 68-04-2: GE8300000

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 6132-04-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 68-04-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6132-04-3 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 68-04-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6132-04-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 68-04-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 6132-04-3: 0

CAS# 68-04-2: 0

Canada - DSL/NDSL

CAS# 68-04-2 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

FISHER SCIENTIFIC CO;CHEMICAL MFG DIV -- SODIUM
FORMATE,CRYSTAL;PRODUCT CODE:3700 -- 6810-00-063-6904

===== Product Identification =====

Product ID:SODIUM FORMATE,CRYSTAL;PRODUCT CODE:3700
MSDS Date:03/24/1986
FSC:6810
NIIN:00-063-6904
MSDS Number: BPKJQ
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC CO;CHEMICAL MFG DIV
Address:1-REAGENT LN
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
CAGE:1B464

=== Contractor Identification ===

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

===== Composition/Information on Ingredients =====

Ingred Name:SODIUM FORMATE (FORMIC ACID,SODIUM SALT)
CAS:141-53-7
RTECS #:LR0350000

===== Hazards Identification =====

LD50 LC50 Mixture:LD50 (ORAL MOUSE) IS 11,200 MG/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:SODIUM FORMATE IS AN IRRITANT OF THE
EYES AND MUCOUS MEMBRANES. CONTACT WITH THE SKIN DOES NOT PRODUCE
ANY IMMEDIATELY IRRITATING EFFECTS IN MOST INDIVIDUALS. INGESTION
OF LARGE AMOUNTS OF THE SUBSTANCE MAY CAUSE VOMITING, NAUSEA, AND
GASTROINTESTINAL DISTURBANCES.

Explanation of Carcinogenicity:CARCINOGEN STATUS:NONE
Effects of Overexposure:EYE;PARTICULATES IN EYE MAY CAUSE LACRIMATION
AND IRRITATION. SKIN:NO IMMEDIATE EFFECTS. INHALED:DUST IS
IRRITATING AND MAY PRODUCE COUGHING OR DYSPNEA. INGESTED:INGESTION
OF LARGE AMOUNTS MAY CAUSE NAUSEA, VOMITING AND ABDOMINAL PAIN.
Medical Cond Aggravated by Exposure:NO INFORMATION GIVEN ON MSDS BY
MFR.

===== First Aid Measures =====

First Aid:EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN. SKIN:WASH WITH SOAP

& WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDRER BEFORE REUSE.
INHALED:REMOVE TO FRESH AIR. RESTORE BREATHING IF NECESSARY.
INGESTED:DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION.
IF VOMITING OCCURS, POSITION TO MINIMIZE POSSIBILITY OF ASPIRATION.
IF IRRITATION PERSISTS OR IS SEVERE,SEE A DOCTOR.

=====
===== Fire Fighting Measures =====

Flash Point:NONE
Extinguishing Media:CARBON DIOXIDE, WATER SPRAY, DRY CHEMICAL OR
REGULAR FOAM
Fire Fighting Procedures:FOR LARGER FIRES, USE WATER SPRAY, FOG OR
REGULAR FOAM.
Unusual Fire/Explosion Hazard:NO ACUTE HAZARD. MOVE CINTAINER FROM FIRE
AEA IF W/O RISK. AVOID BREATHING VAPORS OR DUSTS. KEEP UPWIND.

=====
===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP AND PLACE IN SUITABLE (FIBERBOARD)
CONTAINERES FOR RECLAMATION OR DISPOSAL.
Neutralizing Agent:NO INFORMATION GIVEN ON MSDS BY MFR.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE AWAY FROM INCOMPATABLE
SUBSTANCES.
Other Precautions:NONE

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:THE SPECIFIC RESPIRATOR SELECTED SHOULD BE BASED
ON THE LEVELS OF CONTAMINATION IN THE WORKPLACE. FISHER REQUIRES
THAT THEY CARRY NIOSH AND MSHA APPROVAL. THE VARY FROM A SIMPLE
DUST/MIST RESPIRATOR T O AN SCBM DEPENDING ON THE EXPOSURE.
Ventilation:PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION.
Protective Gloves:NOT REQUIRED BUT RECOMMENDED
Eye Protection:NOT REQUIRED BUT RECOMMENDED
Other Protective Equipment:PROTECTIVE CLOTHING NOT REQUIRED BUT
RECOMMENDED
Work Hygienic Practices:MFR: ? HMIS:USE GOOD CHEMICAL HYGIENE
PRACTICE. AVOID UNNECESSARY CONTACT. WASH THOROUGHLY BEFORE EATING
OR DRINKING.
Supplemental Safety and Health
MSDS RECEIVED FROM NAVY (FOCAL POINT N). NAVY IDENTIFIED NSN.

=====
===== Physical/Chemical Properties =====

HCC:N1
NRC/State Lic Num:NONE
Boiling Pt:B.P. Text:DECOMPOSES
Melt/Freeze Pt:M.P/F.P Text:487F/253C
Decomp Temp:Decomp Text:487F,253C
Spec Gravity:POWDER
pH:7
Solubility in Water:97%
Appearance and Odor:COLORLESS TO WHITE, DELEQUESCENT, CRYSTALS,
GRANUALS, OR POWDER FORMIC ACID ODO

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
ACIDS. REACTS TO FORM CORROSIVE FORMIC ACID FUMES.
Stability Condition to Avoid: HEAT.
Hazardous Decomposition Products: FORMIC ACID FUMES. FROM THERMAL
DECOMPOSITION, TOXIC SODIUM OXIDE FUMES.

===== Disposal Considerations =====

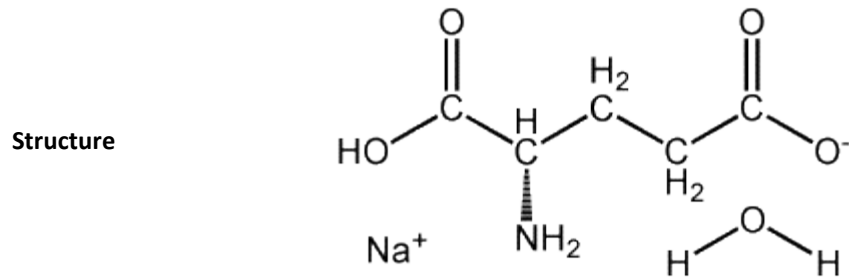
Waste Disposal Methods: OBSERVE ALL LOCAL, STATE AND FEDERAL REGULATIONS
WHEN STORING OR DISPOSING OF THIS MATERIAL. FOR ASSISTANCE CONTACT
DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

Disclaimer (provided with this information by the compiling agencies):
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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Sodium glutamate monohydrate

- Monosodium glutamate monohydrate
- MSG monohydrate
- Monosodium L-glutamate monohydrate
- L-Glutamic acid monosodium salt monohydrate

Formula $C_5H_8NNaO_4 \cdot H_2O$



Description Odorless white solid.

Uses Food additive, flavor enhancer.

Registry Numbers and Inventories.

CAS 6106-04-3

NIH PubChem CID 23689119

EC (EINECS/ELINCS) 612-072-6

RTECS MA1578000

RTECS class Other

Beilstein/Gmelin 4059775

Australia AICS Listed

New Zealand Listed

Philippiens PICCS

Listed

Properties.

Formula C5H10NNaO5

Formula mass 187.12

Melting point, °C 232

Hazards and Protection.

Storage Store in a cool, dry place. Keep container closed when not in use.

Handling Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Protection Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves and clothing to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Small spills/leaks Vacuum or sweep up material and place into a suitable disposal container. Reduce airborne dust and prevent scattering by moistening with water. Clean up spills immediately, using the appropriate protective equipment. Sweep up, then place into a suitable container for disposal.

Stability Stable under normal temperatures and pressures.

Incompatibilities Strong oxidizing agents.

Decomposition

Carbon monoxide, oxides of nitrogen, irritating and toxic fumes and gases, carbon dioxide, toxic fumes of sodium oxide.

Fire.**Fire fighting**

Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. To extinguish fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

NFPA

Health 0

Flammability 0

Reactivity 0

Health.**Exposure effects****Ingestion**

May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation

May cause respiratory tract irritation.

Skin

May cause skin irritation.

Eyes

May cause eye irritation.

First aid**Ingestion**

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Eyes

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Material Safety Data Sheet

Sodium oxalate

ACC# 21450

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium oxalate

Catalog Numbers: AC207720000, AC207720050, AC207721000, AC207725000, AC270540000, AC270540010, AC270540050, BP353-500, S487-500

Synonyms: Ethanedioic acid, disodium salt; Oxalic acid, disodium salt; Disodium oxalate; Sodium oxalate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
62-76-0	Sodium oxalate	> 99.5	200-550-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause kidney damage. Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, heart, eyes, skin, brain, nerves, mucous membranes.

Potential Health Effects

Eye: Causes eye irritation. May result in corneal injury.

Skin: Oxalate is an irritant and may cause dermatitis. Skin lesions begin with epithelial cracking and the formation of slow-healing ulcers. The fingers may appear cyanotic.

Ingestion: Ulcerations of the mouth, vomiting of blood, and rapid appearance of shock,

convulsions, twitching, tetany, and cardiovascular collapse may occur following ingestion of oxalic acid or its soluble salts. Systemic effects may be due to formation of calcium oxalate which is insoluble at physiological pH and can be deposited in the brain and kidney tubules. Resultant hypocalcemia might disturb the function of the heart and nerves. Mean lethal dose for oxalates in adults is estimated at 10 - 30 grams (143 - 428 mg/kg).

Inhalation: Inhalation of oxalic acid dust or vapor produces irritation of the respiratory tract, protein in the urine, nosebleed, ulceration of the mucous membranes, headache, nervousness, cough, vomiting, emaciation, back pain (due to kidney injury), and weakness.

Chronic: Inhalation of oxalic acid dust or mist over a long period of time might result in weight loss and respiratory tract inflammation. Rats administered oxalic acid at 2.5 and 5% in the diet for 70 days developed depressed thyroid function and weight loss. A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: Intravenous administration of calcium gluconate or calcium chloride may be required if hypocalcemia or hypocalcemic tetany occur.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Oxalates slowly corrode steel.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium oxalate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium oxalate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: odorless
pH: Neutral in solution.
Vapor Pressure: Negligible.
Vapor Density: Not applicable.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Decomposes
Freezing/Melting Point: 250 - 270 deg C
Decomposition Temperature: 250 - 270 deg C
Solubility: Moderately soluble in water.
Specific Gravity/Density: 2.34 (water=1)
Molecular Formula: C₂O₄Na₂
Molecular Weight: 134

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, dust generation, moisture, Oxalates slowly corrode steel.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, sodium oxide, formic acid.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 62-76-0: K11750000
LD50/LC50:
CAS# 62-76-0:
Oral, mouse: LD50 = 5094 mg/kg;
Oral, rat: LD50 = 11160 mg/kg;

Mean lethal dose for oxalates in adults is estimated at 10-30 grams (143-428 mg/kg).

Carcinogenicity:
CAS# 62-76-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Teratogenicity: No information found

Reproductive Effects: Oxalic acid caused kidney damage in fetal sheep and rats and disturbed the estrus cycle in rats. Increased sperm abnormalities were seen in the second generation of mice administered 0.2% oxalic acid in the drinking water.

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	Toxic Solid, Organic, N.O.S.
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 62-76-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 62-76-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 62-76-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 62-76-0: 1

Canada - DSL/NDSL

CAS# 62-76-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sodium sulfhydrate

ACC# 21280

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium sulfhydrate

Catalog Numbers: S423-500

Synonyms: Sodium bisulfide; Sodium hydrogen sulfide; Sodium hydrosulfide; Sodium mercaptan; Sodium mercaptide; Sodium sulfhydrate; Sodium sulfide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
16721-80-5	Sodium sulfhydrate	74	240-778-0
7732-18-5	Water	<25	231-791-2
1344-08-7	Sodium sulfide	1.5	215-686-9
7772-98-7	Sodium thiosulfate	0.4	231-867-5
497-19-8	Sodium carbonate anhydrous	0.3	207-838-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to yellow flakes. Flash Point: 90 deg C.

Danger! Causes eye and skin burns. Pyrophoric. Spontaneously flammable in air. Contact with acids liberates toxic gas. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye burns. May cause chemical conjunctivitis and corneal damage.

Skin: Causes skin burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. Mercaptans may cause nausea and headache. Exposure to high concentrations of mercaptans can produce unconsciousness with cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), cold extremities and rapid pulse. May cause systemic effects.

Inhalation: Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. Aspiration may lead to pulmonary edema. May cause systemic effects. Exposure to high concentrations of mercaptans can produce unconsciousness with cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), cold extremities and rapid pulse. Mercaptans may cause nausea and headache.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. May burn with invisible flame. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Spontaneously ignitable in air.

Extinguishing Media: Use dry sand or earth to smother fire. Use foam, dry chemical, or carbon dioxide. Contact professional fire-fighters immediately.

Flash Point: 90 deg C (194.00 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:4.3

Upper: 45.5

NFPA Rating: (estimated) Health: 3; Flammability: 4; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Isolate area and deny entry. Provide ventilation. Place under an inert atmosphere. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Use spark-proof tools and explosion proof equipment. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Handle under an inert atmosphere. Do not allow contact with water. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids. Do not expose to air. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium sulphhydrate	none listed	none listed	none listed
Water	none listed	none listed	none listed
Sodium sulfide	none listed	none listed	none listed
Sodium thiosulfate	none listed	none listed	none listed
Sodium carbonate	none listed	none listed	none listed

anhydrous			
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OSHA Vacated PELs: Sodium sulfhydrate: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical. Sodium sulfide: No OSHA Vacated PELs are listed for this chemical. Sodium thiosulfate: No OSHA Vacated PELs are listed for this chemical. Sodium carbonate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Flakes

Appearance: white to yellow

Odor: rotten egg-like - mild odor

pH: Alkaline in solution

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not applicable.

Boiling Point: 164.4 deg C

Freezing/Melting Point:52.2 deg C

Decomposition Temperature:Not available.

Solubility: Completely soluble in water.

Specific Gravity/Density:Not available.

Molecular Formula:NaSH

Molecular Weight:56.07

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Powder or liquid is pyrophoric.

Conditions to Avoid: Ignition sources, dust generation, moisture, exposure to air.

Incompatibilities with Other Materials: Acids, metals.

Hazardous Decomposition Products: Oxides of sulfur, hydrogen sulfide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 16721-80-5: WE1900000

CAS# 7732-18-5: ZC0110000

CAS# 1344-08-7 unlisted.

CAS# 7772-98-7: XN6476000

CAS# 497-19-8: VZ4050000

LD50/LC50:

Not available.

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 1344-08-7:

CAS# 7772-98-7:

CAS# 497-19-8:

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, eye: 50 mg Severe;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, mouse: LC50 = 1200 mg/m³/2H;

Inhalation, rat: LC50 = 2300 mg/m³/2H;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, rat: LD50 = 4090 mg/kg;

Carcinogenicity:

CAS# 16721-80-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 1344-08-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7772-98-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 497-19-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	SODIUM HYDROSULFIDE	No information available.
Hazard Class:	4.2	
UN Number:	UN2318	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 16721-80-5 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 1344-08-7 is listed on the TSCA inventory.

CAS# 7772-98-7 is listed on the TSCA inventory.

CAS# 497-19-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 16721-80-5: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 16721-80-5: immediate, delayed, reactive.

CAS # 497-19-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 16721-80-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 16721-80-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 1344-08-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7772-98-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 497-19-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 31 Contact with acids liberates toxic gas.

R 34 Causes burns.

R 7 May cause fire.

Safety Phrases:

S 25 Avoid contact with eyes.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 50A Do not mix with acids.

WGK (Water Danger/Protection)

CAS# 16721-80-5: 2

CAS# 7732-18-5: No information available.

CAS# 1344-08-7: No information available.

CAS# 7772-98-7: 0

CAS# 497-19-8: 1

Canada - DSL/NDSL

CAS# 16721-80-5 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 1344-08-7 is listed on Canada's DSL List.

CAS# 7772-98-7 is listed on Canada's DSL List.

CAS# 497-19-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 16721-80-5 is listed on the Canadian Ingredient Disclosure List.

CAS# 497-19-8 is listed on the Canadian Ingredient Disclosure List.

EMS CATALOG NO: 21190
EMS PRODUCT: Sodium Phosphate Monobasic
DATE: 04/11/95
PAGE NUMBER: One of 6

MATERIAL SAFETY DATA SHEET

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

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P.O. BOX 251
FORT WASHINGTON, PA 19034 24 HOUR EMERGENCY PHONE NUMBER
(215) 646-1566 CHEMTREC: (800) 424-9300

FOR PRODUCT AND SALES INFORMATION

CONTACT ELECTRON MICROSCOPY SCIENCES OFFICE ABOVE.

PRODUCT IDENTIFICATION

PRODUCT NAME: Sodium Phosphate, Monobasic

CAS NUMBER: 7558-80-7

TRADE NAMES/SYNONYMS:

Monosodium phosphate; Sodium dihydrogen phosphate;
Monosodium dihydrogen phosphate; Sodium biphosphate;
Acid sodium phosphate; Monosodium orthophosphate; MSP;
Phosphoric Acid, Monosodium Salt; Dihydrogen Sodium
Phosphate; Monobasic Sodium Phosphate; Monosodium
Hydrogen Phosphate; Sodium diphosphate anhydrous; Sodium
dihydrogen, monophosphate; Sodium dihydrogen orthophosphate; Sodium
phosphate (NA(H₂P₀₄)); Sodium primary phosphate; Sodium phosphate;
NaH₂PO₄; OHS15190

CHEMICAL FAMILY: Inorganic salt

MOLECULAR FORMULA: NaH₂PO₄

MOLECULAR WEIGHT: 119.98

CERCLA RATING (SCALE 0-3): NFPA RATINGS (SCALE 0-4):

HEALTH=3 HEALTH=U
FIRE=1 FIRE=1
REACTIVITY=0 REACTIVITY=0
PERSISTENCE=0

COMPONENTS AND CONTAMINANTS

COMPONENT: Sodium phosphate, monobasic
PERCENT: 100
OTHER CONTAMINANTS: None
EXPOSURE LIMITS: No occupational exposure limits established by OSHA, ACGIH, or NIOSH.

PHYSICAL DATA

DESCRIPTION: White, crystalline powder.
MELTING POINT: 437oF (225oC) (Decomposes)
SPECIFIC GRAVITY: Approx. 2.0
VAPOR PRESSURE: Negligible PH: 4.5 @ 0.1 m soln.
SOLUBILITY IN WATER: Very soluble
SOLVENT SOLUBILITY: Very slightly soluble in ether, chloroform, toluene; insoluble in alcohol.

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:

Slight fire hazard when exposed to heat or flame.

FIREFIGHTING MEDIA:

Dry chemical, carbon dioxide, halon, water spray or standard foam (1990 Emergency Response Guidebook, DOT P 5800.5).

For larger fires, use water spray, fog or standard foam (1990 Emergency Response Guidebook, DOT P 5800.5).

Move container from fire area if possible. Do not scatter spilled material with high pressure water streams. Dike fire control water for later disposal (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 31).

Use agents suitable for type of surrounding fire. Avoid breathing hazardous vapors, keep upwind.

TOXICITY

IRRITATION DATA: 50 mg eye-human mild; 150 mg eye-rabbit mild.

TOXICITY DATA: 8290 mg/kg oral-rat LD50;
250 mg/kg intramuscular-rat LD50

MONOHYDRATE: No data available.

DIHYDRATE: >5008 mg/kg intraperitoneal-mouse LD50.
CARCINOGEN STATUS: None

ACUTE TOXICITY LEVEL: Slightly toxic by ingestion.

TARGET EFFECTS: Poisoning may affect the calcium metabolism.

HEALTH EFFECTS AND FIRST AID

INHALATION:

ACUTE EXPOSURE: Inhalation of dust may cause irritation.

CHRONIC EXPOSURE: No data available.

FIRST AID: Remove from exposure area to fresh air immediately.
If breathing has stopped, perform artificial respiration. Keep
person warm and at rest. Treat symptomatically and supportively.
Get medical attention immediately.

SKIN CONTACT:

ACUTE EXPOSURE: May cause irritation.

CHRONIC EXPOSURE: Repeated and prolonged contact may cause dermatitis.

FIRST AID: Removed contaminated clothing and shoes immediately.
Wash affected area with soap or mild detergent and large amounts
of water until no evidence of chemical remains (approximately 15-20
minutes). Get medical attention immediately.

EYE CONTACT:

ACUTE EXPOSURE: May cause transient irritation. Tested on rabbit
eyes by continuous exposure for three hours at 0.1 M solution at
pH 7.0 to 7.5 made up to 0.46 osmolar with sodium chloride or
sucrose, caused no disturbance of the cornea.

CHRONIC EXPOSURE: No data available.

FIRST AID: Wash eyes immediately with large amounts of water or
normal saline, occasionally lifting upper and lower lids, until
no evidence of chemical remains (approximately 15-20 minutes).
Get medical attention immediately.

INGESTION:

ACUTE EXPOSURE: Ingestion may result in abdominal pain, nausea,
vomiting, diarrhea, cramps, pain and burning in the mouth. Doses
of 250 gm/kg given orally to guinea pigs, rats and rabbits produced
diarrhea. Generally, phosphates are slowly and incompletely absorbed,

therefore systemic reactions are unlikely when these salts are given orally. Sodium phosphates are capable of seriously reducing the ionic serum calcium.

CHRONIC EXPOSURE: Sodium phosphate, monobasic is used as a food additive. No adverse effects have been reported.

FIRST AID: Treat symptomatically and supportively. Get medical attention immediately. If vomiting occurs, keep head lower than hips to prevent aspiration.

ANTIDOTE:

The following antidote has been recommended. However, the decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel.

PHOSPHATES:

For hypocalcemia, after phosphate ingestion, give calcium gluconate, 5 ml of 10% solution slowly intravenously, to restore ionic calcium to normal level (Dreisbach, Handbook of Poisoning, 12th Ed.). Antidote should be administered by qualified medical personnel.

REACTIVITY

REACTIVITY: Stable under normal temperatures and pressures.

INCOMPATIBILITIES:

BRASS: May be corrosive in the presence of moisture.

METALS: Solutions may be corrosive.

STEEL: May be corrosive in the presence of moisture.

DECOMPOSITION: Thermal decomposition products may include toxic and hazardous sodium oxide and oxides of phosphorus.

POLYMERIZATION: Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

STORAGE AND DISPOSAL

Observe all Federal, State and local regulations when storing or disposing of this substance. For assistance, contact the district director of the Environmental Protection Agency.

Store away from incompatible substances.

CONDITIONS TO AVOID

May burn but does not ignite readily. Avoid contact with strong

oxidizers, excessive heat, sparks, or open flame.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:

Stop leak if you can do it without risk. For small spills, take up with sand or other absorbent material and place into clean, dry containers for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry.

PROTECTIVE EQUIPMENT

VENTILATION: Provide local exhaust or process enclosure ventilation system.

RESPIRATOR:

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection. The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Dust and mist respirator with a full facepiece. Air-purifying full facepiece respirator with a high-efficiency particulate filter.

Powered air-purifying respirator with a tight-fitting facepiece and high-efficiency particulate filter.

Type 'C'-supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in continuous-flow mode.

Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode.

Supplied-air respirator with full facepiece and operated in pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.

CLOTHING: Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged

skin contact with this substance.

GLOVES: Employee must wear appropriate protective gloves to prevent contact with this substance.

EYE PROTECTION:Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

EMERGENCY EYE WASH:

Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

Material Safety Data Sheet

Sodium phosphate, dibasic

ACC# 08330

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium phosphate, dibasic

Catalog Numbers: AC204850000, AC204851000, AC204855000, AC424370000, AC424375000, S75218, S80191-3, S93376, BP332-1, BP332-500, NC9261342, S374-1, S374-250LB, S374-3, S374-50, S374-500, S375-100LB, S375-12, S375-212, S375-250LB, S375-500, S379-12, S379-212, S379-250LB, S379-50, S393-3, S3933LC

Synonyms: Sodium phosphate dibasic anhydrous; Disodium hydrogen phosphate; di-Sodium hydrogen orthophosphate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7558-79-4	Sodium phosphate, dibasic	99+	231-448-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation.

Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium phosphate, dibasic	none listed	none listed	none listed

OSHA Vacated PELs: Sodium phosphate, dibasic: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: 8.7 - 9.3 (5% aq.sol. 20°C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: Not available.

Decomposition Temperature: > 240 deg C

Solubility: 75g/L (20°C)

Specific Gravity/Density: Not available.

Molecular Formula: Na₂HPO₄

Molecular Weight: 141.96

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids.

Hazardous Decomposition Products: Oxides of phosphorus, sodium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7558-79-4: WC4500000

LD50/LC50:

CAS# 7558-79-4:

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 500 mg/24H Mild;

Oral, rat: LD50 = 17 gm/kg;

Carcinogenicity:

CAS# 7558-79-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7558-79-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7558-79-4: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7558-79-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7558-79-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7558-79-4: 1

Canada - DSL/NDSL

CAS# 7558-79-4 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

EMS CATALOG NO: 21180
EMS PRODUCT: Sodium Phosphate
Diabasic
DATE: 11/14/95
PAGE NUMBER: One of 4

MATERIAL SAFETY DATA SHEET

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

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321 MORRIS ROAD
P.O. BOX 251
FORT WASHINGTON, PA 19034 24 HOUR EMERGENCY PHONE NUMBER
(215) 646-1566 CHEMTREC: (800) 424-9300

FOR PRODUCT AND SALES INFORMATION

CONTACT ELECTRON MICROSCOPY SCIENCES OFFICE ABOVE.

PRODUCT IDENTIFICATION

PRODUCT NAME: Sodium Phosphate Dibasic Heptahydrate

CAS NUMBER: 07782-85-6

COMMON OR TRADE NAME: Disodium Phosphate

HMIS CODE: H-1, F-0, R-0, P-B

CHEMICAL FORMULA: Na₂HPO₄·7H₂O

MOLECULAR WEIGHT: 268.1

HAZARDOUS INGREDIENTS

COMPONENT % OSHA PEL ACGIH TLV OTHER

Disodium hydrogen phosphate neptahydrate 98 N/E N/E N/E

PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: Not applicable
SPECIFIC GRAVITY (H2O=1): 1.68
VAPOR PRESSURE (mm Hg): Not applicable
VAPOR DENSITY (AIR=1): Not applicable
MELTING POINT: Loses water at 92.5oC
SOLUBILITY IN WATER: 1 g/4 ml
EVAPORATION RATE (Butyl Acetate=1): Not applicable
APPEARANCE AND ODOR: White, odorless crystals

FIRE AND EXPLOSION HAZARD DATA

FIRE HAZARD RATING: Minimal, non-flammable

FLASH POINT: Not applicable

METHOD: Not applicable

FLAMMABLE LIMITS: LEL: Not applicable
UEL: Not applicable

EXTINGUISHING MEDIA: Not applicable

SPECIAL FIRE
FIGHTING PROCEDURES: Not applicable

UNUSUAL FIRE
AND EXPLOSION HAZARDS: Not applicable

REACTIVITY DATA

REACTIVITY HAZARD RATING: Minimal, non-reactive

STABILITY: Stable

CONDITIONS TO AVOID: Prolonged storage
* * * EMS CATALOG NO: 21180 * * * (Page 3 of 4)

INCOMPATIBILITY (MATERIALS TO AVOID): None known

HAZARDOUS DECOMPOSITION OR BY PRODUCTS: None known

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: None known

HEALTH HAZARD DATA

HEALTH HAZARD RATING: Slight. Mild eye irritant.

ROUTE(S) OF ENTRY:

INHALATION?: Yes

INGESTION?: Yes

SKIN?: No

HEALTH HAZARDS (ACUTE AND CHRONIC):

Eye irritant. Respiratory system hazard, acute and chronic.

CARCINOGENICITY:

NTP?: No

IARC MONOGRAPHS?: No

OSHA REGULATED?: No

SIGNS AND SYMPTOMS OF EXPOSURE:

Contact with eyes causes redness and irritation. Inhalation of dusts, mists or aerosols may cause irritation of the respiratory tract. Ingestion may cause unknown effects. Effects of repeated low level exposures are unknown.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

None known

EMERGENCY AND FIRST AID PROCEDURES:

EYE(S): Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes.

SKIN: Remove product and flush affected area with water.

INHALATION: Move patient to fresh air. Call a physician.

* * * EMS CATALOG NO: 21180 * * * (Page 4 of 4)

INGESTION: If swallowed, call a physician immediately. Induce vomiting only as directed by medical personnel. Never give anything by mouth to an unconscious person.

PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Shovel spilled chemical product into dry container for later disposal or recovery. Remove from the spill location. Flush area with water.

WASTE DISPOSAL METHOD:

Flush to industrial sewer with large amount of water. Comply with all Federal, State, and Local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

No special precautions required.

OTHER PRECAUTIONS: No special precautions required.

CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE):

Not generally required. NIOSH approved particulate respirator.

VENTILATION: Adequate general and local exhaust.

SPECIAL: No

OTHER: No

EYE PROTECTION: Chemical safety goggles

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

Eye wash stations readily accessible. Safety shower. Barrier creams.

WORK/HYGIENIC PRACTICES:

Wash at the end of each workshift and before eating, smoking or using the toilet. Wash promptly if skin becomes contaminated.

N/E None established

Material Safety Data Sheet

Sodium bismuthate(V)

ACC# 37093

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium bismuthate(V)

Catalog Numbers: AC205210000, AC205210250, AC205212500

Synonyms: BiNaO₃. (The bismuthate of commerce contains about 85% NaBiO₃; the balance is chiefly water and Bi₂O₃.)

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12232-99-4	Sodium bismuthate(V)	85	235-455-6
1304-76-3	Bismuth oxide (Bi ₂ O ₃)	<15	215-134-7
7732-18-5	Water	<15	231-791-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown powder.

Warning! Harmful if swallowed. May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract.

Inhalation: May be harmful if inhaled. Inhalation of dust may cause respiratory tract irritation.

Chronic: May cause appetite loss, diarrhea, skin abnormalities, and digestive tract disturbances.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Decomposes at high temperatures releasing oxygen which may cause an existing fire to burn more vigorously.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium bismuthate(V)	none listed	none listed	none listed
Bismuth oxide (Bi ₂ O ₃)	none listed	none listed	none listed
Water	none listed	none listed	none listed

OSHA Vacated PELs: Sodium bismuthate(V): No OSHA Vacated PELs are listed for this chemical. Bismuth oxide (Bi₂O₃): No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: yellow to brown

Odor: None reported.

pH: 10 @ 5% aq. sol.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:Not available.
Decomposition Temperature:Not available.
Solubility: insoluble in cold, dec by hot
Specific Gravity/Density:Not available.
Molecular Formula:BiNaO3
Molecular Weight:279.96

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Toxic fumes of sodium oxide, bismuth oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 12232-99-4: VZ1750000

CAS# 1304-76-3: EB2984460

CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 12232-99-4:

Oral, rat: LD50 = 420 mg/kg;

CAS# 1304-76-3:

Oral, mouse: LD50 = 10 gm/kg;

Oral, rat: LD50 = 5000 mg/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

Carcinogenicity:

CAS# 12232-99-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 1304-76-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found
Mutagenicity: See actual entry in RTECS for complete information.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12232-99-4 is listed on the TSCA inventory.
CAS# 1304-76-3 is listed on the TSCA inventory.
CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1304-76-3: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12232-99-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 1304-76-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:**WGK (Water Danger/Protection)**

CAS# 12232-99-4: No information available.

CAS# 1304-76-3: 1

CAS# 7732-18-5: No information available.

Canada - DSL/NDSL

CAS# 12232-99-4 is listed on Canada's DSL List.

CAS# 1304-76-3 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

FUJISAWA USA INC (LYPHOMED INC) -- SODIUM CHLORIDE INJECTION -- 6505-00F036269

=====
===== Product Identification =====

Product ID:SODIUM CHLORIDE INJECTION
MSDS Date:01/01/1994
FSC:6505
NIIN:00F036269
MSDS Number: BTVPL
=== Responsible Party ===
Company Name:FUJISAWA USA INC (LYPHOMED INC)
Address:3 PARKWAY NORTH
City:DEERFIELD
State:IL
ZIP:60015-2548
Country:US
Info Phone Num:800-727-7003/708-317-8800
Emergency Phone Num:708-317-8202
Preparer's Name:CHRISTINA J BARRINGTON
CAGE:24832

==== Contractor Identification ====
Company Name:FUJISAWA USA INC (LYPHOMED INC)
Address:3 PARKWAY NORTH
City:DEERFIELD
State:IL
ZIP:60015-2548
Country:US
Phone:800-727-7003/708-317-8800
CAGE:24832
Company Name:FUJISAWA USA, INC
Address:3 PKY N
Box:City:DEERFIELD
State:IL
ZIP:60015-2548
Country:US
Phone:847-317-1256
CAGE:39832

=====
===== Composition/Information on Ingredients =====

Ingred Name:BENZYL ALCOHOL
CAS:100-51-6
RTECS #:DN3150000
Fraction by Wt: 0.9%

Ingred Name:METHYL PARAHYDROXYBENZOATE, METHYLPARABEN
CAS:99-76-3
RTECS #:DH2450000
Fraction by Wt: 0.12%

Ingred Name:BENZOIC ACID, 4-HYDROXY-, PROPYL ESTER, PROPYLPARABEN
CAS:94-13-3
RTECS #:DH2800000
Fraction by Wt: .012%

Ingred Name:SODIUM CHLORIDE

CAS:7647-14-5
RTECS #:VZ4725000

Ingred Name:WATER
CAS:7732-18-5
RTECS #:ZC0110000

=====
===== Hazards Identification =====
=====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:IMMEDIATE EFFECTS: EYE, SKIN &
RESPIRATORY IRRITATION MAY OCCUR.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IMMEDIATE EFFECTS: EYE, SKIN & RESPIRATORY
IRRITATION MAY OCCUR.
Medical Cond Aggravated by Exposure:PRE-EXISTING SKIN & RESPIRATORY
CONDITIONS.

=====
===== First Aid Measures =====
=====

First Aid:INHALATION: REMOVE TO FRESH AIR. GIVE CPR IF REQUIRED.
INGESTION: FLUSH MOUTH OUT W/WATER. SKIN: FLUSH AREA W/WATER FOR AT
LEAST 15 MINS. EYES: IMMEDIATELY FLUSH W/WATER FOR AT LEAST 15
MINS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
===== Fire Fighting Measures =====
=====

Flash Point Method:CC
Flash Point: >200F
Extinguishing Media:WATER SPRAY, DRY CHEMICAL, CO2/FOAM.
Fire Fighting Procedures:WEAR SCBA & PROTECTIVE CLOTHING.

=====
===== Accidental Release Measures =====
=====

Spill Release Procedures:WEAR RECOMMENDED PERSONAL PROTECTIVE
EQUIPMENT. USE ABSORBENT TOWELS/BOOMS TO CLEAN UP. WIPE SURFACES
CLEAN & WASH W/SOAP & WATER.

=====
===== Handling and Storage =====
=====

Handling and Storage Precautions:WHEN HANDLING PHARMACEUTICAL PRODUCTS,
AVOID ALL CONTACT & INHALATION OF DUST, FUMES, MIST &/VAPORS
ASSOCIATED W/THE PRODUCT.

=====
===== Exposure Controls/Personal Protection =====
=====

Respiratory Protection:W/SATISFACTORY VENTILATION, RESPIRATORY
PROTECTION NOT USUALLY REQUIRED.
Ventilation:GENERAL ROOM VENTILATION IS USUALLY SATISFACTORY, USE LOCAL
EXHAUST VENTILATION WHEN NECESSARY.
Protective Gloves:DISPOSABLE LATEX
Eye Protection:SAFETY GLASSES/GOGGLES
Other Protective Equipment:DISPOSABLE GARMENTS
Work Hygienic Practices:REMOVE/LAUNDRER CONTAMINATED CLOTHING BEFORE
REUSE.
Supplemental Safety and Health

THIS PRODUCT IS INTENDED FOR THERAPEUTIC USE ONLY WHEN PRESCRIBED BY A
PHYSICIAN.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:2575.4F
Melt/Freeze Pt:M.P/F.P Text:1473.8F
pH:4.5-7
Solubility in Water:COMPLETE
Appearance and Odor:CLEAR, COLORLESS, ODORLESS SOLUTION.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
Stability Condition to Avoid:EXCESSIVE HEAT
Hazardous Decomposition Products:SMOKE, & TOXIC FUMES OF CHLORINE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IAW/LOCAL, STATE & FEDERAL
REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Sodium chromate

ACC# 21130

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium chromate

Catalog Numbers: AC377870000, AC377870050, AC377870250, AC377871000, 61139-5000, S272-250, S272-500

Synonyms: Chromic acid, disodium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7775-11-3	Sodium chromate	100	231-889-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Danger! Toxic if swallowed. Danger of serious damage to health by prolonged exposure through inhalation. May be fatal if inhaled. Causes burns by all exposure routes. Strong oxidizer. Contact with other material may cause a fire. May impair fertility. May cause harm to the unborn child. Harmful if absorbed through the skin. Cancer hazard. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause heritable genetic damage. May cause sensitization by inhalation and by skin contact. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, kidneys, liver, respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns.

Skin: Harmful if absorbed through the skin. Causes skin burns. May cause sensitization by skin contact.

Ingestion: Causes gastrointestinal tract burns. Toxic if swallowed.

Inhalation: May be fatal if inhaled. Causes chemical burns to the respiratory tract. May cause respiratory sensitization.

Chronic: May cause cancer in humans. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals. Possible risk of harm to the unborn child. May impair fertility.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use foam, dry chemical, or carbon dioxide.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 4; Flammability: 1; Instability: 2; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Wear a self contained breathing apparatus and appropriate personal protection. (See

Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material. Evacuate unnecessary personnel. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Do not store near combustible materials. Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium chromate	0.05 mg/m ³ TWA (as Cr) (listed under Chromium (VI) compounds- water soluble).	0.001 mg/m ³ TWA (as Cr) (listed under Chromates). 15 mg/m ³ IDLH (as Cr(VI)) (listed under Chromates).	5 æg/m ³ TWA (listed under Chromium (VI) compounds). 0.1 mg/m ³ Ceiling (as CrO ₃ , applies to any operations or sectors for which the H exavalent Chromium standard [29 CFR 1910.1026] is stayed or is otherwise not in effect) (listed under Chromates). 2.5 æg/m ³ Action Level (as Cr.); 5 æg/m ³ TWA (as Cr, Cancer hazard - see 29 CFR 1910.1026) (listed under Chromium (VI) compounds).

OSHA Vacated PELs: Sodium chromate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow

Odor: odorless

pH: 9.2 (100 g/L aq.sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 792 deg C

Decomposition Temperature: Not available.

Solubility: 530 g/L (20°C)

Specific Gravity/Density: Not available.

Molecular Formula: CrNa₂O₄

Molecular Weight: 161.97

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, combustible materials, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents.

Hazardous Decomposition Products: Toxic fumes of sodium oxide, toxic chromium oxide fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7775-11-3: GB2955000

LD50/LC50:

CAS# 7775-11-3:

Oral, rat: LD50 = 136 mg/kg;

Dermal LDLo guinea pig: 206 mg/kg.

Carcinogenicity:

CAS# 7775-11-3:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Chromium (VI) compounds-water soluble').
- **California:** carcinogen, initial date 2/27/87 (listed as Chromium (VI) compounds).
- **NTP:** Known carcinogen (listed as Chromium (VI) compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: IARC Group 1: Proven human carcinogenic substance.

Teratogenicity: No information found.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information reported

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, TOXIC, N.O.S.	OXIDIZING SOLID, TOXIC, N.O.S.
Hazard Class:	5.1	5.1
UN Number:	UN3087	UN3087
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7775-11-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 7775-11-3: Section 6, 0.1 % de minimus concentration [see 40 CFR 749.68]

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7775-11-3: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7775-11-3: immediate, delayed.

Section 313

This material contains Sodium chromate (listed as Chromium (VI) compounds), 100%, (CAS# 7775-11-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7775-11-3 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7775-11-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Chromium (VI) compounds- water soluble), Minnesota, (listed as Chromium (VI) compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Sodium chromate, listed as 'Chromium (VI) compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T+ N

Risk Phrases:

- R 21 Harmful in contact with skin.
- R 25 Toxic if swallowed.
- R 26 Very toxic by inhalation.
- R 34 Causes burns.
- R 42/43 May cause sensitization by inhalation and skin contact.
- R 45 May cause cancer.
- R 46 May cause heritable genetic damage.
- R 48/23 Toxic : danger of serious damage to health by prolonged exposure through inhalation.
- R 60 May impair fertility.
- R 61 May cause harm to the unborn child.
- R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S 53 Avoid exposure - obtain special instructions before use.
- S 60 This material and its container must be disposed of as hazardous waste.
- S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7775-11-3: 3

Canada - DSL/NDSL

CAS# 7775-11-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, D2A, D2B, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

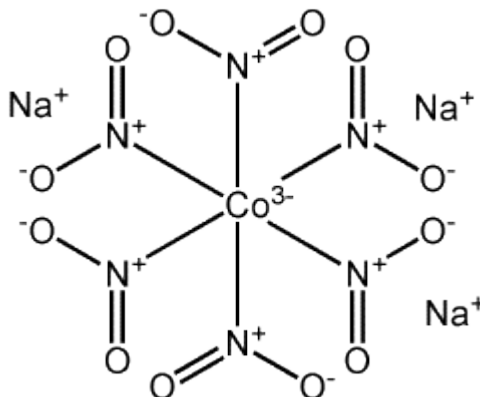
CAS# 7775-11-3 is listed on the Canadian Ingredient Disclosure List.

Sodium cobaltnitrite

- Cobaltate(3-), hexanitro-, trisodium
- Trisodium cobalt hexanitrite
- Sodium hexanitrocobaltate(III)

Formula $\text{Na}_3[\text{Co}(\text{NO}_2)_6]$

Structure



Description yellow-brown crystalline powder.

Uses For the detection of potassium with which it forms a slightly sol compound.

Registry Numbers and Inventories.

CAS 13600-98-1

NIH PubChem CID 16211641

EC (EINECS/ELINCS) 237-077-7

EC Class O; Carc, R: 8-40, S: 25-36/37

RTECS GF9480000

RTECS class Organometallic; Reproductive Effector

UN (DOT) 1479

Merck	12,8748
Beilstein/Gmelin	12519 (G)
Australia AICS	Listed
New Zealand	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	Co6N6Na3O12
Formula mass	403.94
Vapor density (air=1)	N/R
Solubility in water	720 g/L (20 C)

Hazards and Protection.

Storage	Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Minimize dust generation and accumulation. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Do not ingest or inhale.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.
Disposal code	15
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Reducing agents, mineral acids, organic materials, amines, strong acids.
Decomposition	Nitrogen oxides, cobalt/cobalt oxides.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with combustible materials may cause a fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water with caution and in flooding amounts. Extinguishing media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. Contact professional fire-fighters immediately.
Fire potential	These substances will accelerate burning when involved in a fire.
Hazards	May explode from heat or contamination. May react explosively with hydrocarbons (fuels). May ignite combustibles.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure effects	Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause fetal effects. Prolonged inhalation can cause a sharp drop in blood pressure, throbbing, headache, nausea, and weakness. Cobalt
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compounds may cause cancer based upon animal studies. Damage to kidney tubules or glomeruli may occur. May cause cyanosis - a blue-gray coloring of the skin and lips caused by a lack of oxygen.

Ingestion May cause liver damage. Can cause nervous system damage. Exposure may cause anemia and other blood abnormalities. May cause burns to the gastrointestinal tract. May cause nausea, vomiting, and diarrhea, possibly with blood. May cause cardiac and thyroid

Inhalation May cause allergic respiratory reaction. May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. May cause effects similar to those described for ingestion. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Skin May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May cause severe irritation and possible burns.

Eyes May cause eye irritation. May cause conjunctivitis. May cause permanent corneal opacification.

First aid

Ingestion Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Do not use mouth-to-mouth respiration if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Skin Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Transportation.

UN number 1479

Response guide [140](#)

Hazard class 5.1



Packing Group I; II; III

HS Code 2842 90 90

Material Safety Data Sheet

Sodium dichromate

ACC# 91827

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium dichromate

Catalog Numbers: S75212, S258-3

Synonyms: Sodium bichromate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10588-01-9	Sodium dichromate	100	234-190-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange to red crystals. **Danger!** Strong oxidizer. Contact with other material may cause a fire. May cause allergic skin reaction. May be fatal if inhaled. Harmful if swallowed or absorbed through the skin. Causes severe eye irritation and possible eye injury. May cause liver and kidney damage. May cause cancer by inhalation. Causes skin and respiratory tract irritation.

Target Organs: Kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: Causes skin irritation. Harmful if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Chrome ulcers, penetrating lesions of the skin, occur chiefly on the hand and forearm where

there has been a break in the epidermis.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns. May cause liver and kidney damage.

Inhalation: May be fatal if inhaled. Causes respiratory tract irritation. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated exposure may lead to asthma and perforation of the nasal septum. May cause cancer in humans.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Do not flush into a sewer. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Isolate area and deny

entry. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Avoid contact with clothing and other combustible materials. Do not breathe dust. Use only with adequate ventilation or respiratory protection.

Storage: Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium dichromate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium dichromate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: orange to red

Odor: odorless
pH: 4 (10% solution)
Vapor Pressure: 0 mm Hg @ 20 deg C
Vapor Density: Not available.
Evaporation Rate:Not applicable.
Viscosity: Not available.
Boiling Point: 400 deg C (dec)
Freezing/Melting Point:357 deg C
Decomposition Temperature:400 deg C
Solubility: Freely Soluble.
Specific Gravity/Density:2.52 @ 13°C
Molecular Formula:Na₂Cr₂O₇
Molecular Weight:261.97

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation, excess heat.
Incompatibilities with Other Materials: Reducing agents, anhydrides, finely powdered metals, hydrazine, hydroxylamine, sulfuric acid, organic matter, hydrochloric acid, hydrazine derivatives, combustible materials.
Hazardous Decomposition Products: No data available.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10588-01-9; HX7700000; HX7720000
LD50/LC50:
CAS# 10588-01-9:
Oral, rat: LD50 = 50 mg/kg; <BR.

Carcinogenicity:
CAS# 10588-01-9: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals.
Teratogenicity: No data available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: A mutagenic effect has been demonstrated in animal studies on mammals.
Other Studies: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Concentration in organisms possible. Highly toxic for aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	OXIDIZING SOLID, TOXIC, N.O.S.				No information available.
Hazard Class:	5.1				
UN Number:	UN3087				
Packing Group:	III				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10588-01-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 10588-01-9: Present

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA**CERCLA Hazardous Substances and corresponding RQs**

CAS# 10588-01-9: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 10588-01-9: acute, chronic, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 10588-01-9 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10588-01-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

T+ O N

Risk Phrases:

R 21 Harmful in contact with skin.

R 25 Toxic if swallowed.

R 26 Very toxic by inhalation.

R 37/38 Irritating to respiratory system and skin.

R 41 Risk of serious damage to eyes.

R 43 May cause sensitization by skin contact.

R 46 May cause heritable genetic damage.

R 8 Contact with combustible material may cause fire.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 10588-01-9: 3

Canada - DSL/NDSL

CAS# 10588-01-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, C, D1A.

Canadian Ingredient Disclosure List

CAS# 10588-01-9 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

**SIGMA CHEMICAL COMPANY -- 331988 SODIUM DIHYDROGENPHOSPHATE,99% --
6810-00F050273**

=====
===== Product Identification =====

Product ID:331988 SODIUM DIHYDROGENPHOSPHATE,99%
MSDS Date:05/28/1996
FSC:6810
NIIN:00F050273
MSDS Number: BZXMW
=== Responsible Party ===
Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:SAINT LOUIS
State:MO
ZIP:63178-5000
Country:US
Info Phone Num:314-771-5765/800-325-3010
Emergency Phone Num:314-771-5765/800-325-3010
CAGE:21076

==== Contractor Identification ====

Company Name:ALDRICH CHEMICAL CO INC
Address:1001 WEST ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:60928

Company Name:FLUKA CHEMICAL CORP
Address:1001 WEST ST PAUL
Box:City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:414-273-3850
CAGE:63181

Company Name:SIGMA CHEMICAL COMPANY
Address:3050 SPRUCE ST
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

=====
===== Composition/Information on Ingredients =====

Ingrid Name:SODIUM PHOSPHATE MONOBASIC, MONOSODIUM PHOSPHATE
CAS:7558-80-7
RTECS #:WA1900000
Fraction by Wt: 99%

=====
===== Hazards Identification =====

LD50 LC50 Mixture:ORAL LD50(RAT): 8290 MG/KG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:MAY BE HARMFUL BY INHALATION,
INGESTION/SKIN ABSORPTION. EYES/SKIN: IRRITATION. INHALATION:
IRRITATION TO MUCOUS MEMBRANES & UPPER RESPIRATORY TRACT.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION.

=====
First Aid Measures
=====

First Aid:EYES: FLUSH W/COPIOUS AMOUNTS OF WATER FOR 15 MINS. SKIN:
WASH W/SOAP & COPIOUS AMOUNTS OF WATER. INHALATION: REMOVE TO FRESH
AIR. GIVE CPR/OXYGEN IF NEEDED. INGESTION: WASH OUT MOUTH W/WATER
PROVIDED PERSON IS CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL
CASES.

=====
Fire Fighting Measures
=====

Extinguishing Media:USE MEDIA APPROPRIATE FOR SURROUNDING AREAS.
Fire Fighting Procedures:WEAR SCBA & PROTECTIVE CLOTHING.
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
Accidental Release Measures
=====

Spill Release Procedures:WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES,
RUBBER BOOTS & HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG & HOLD
FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA & WASH SITE
AFTER MATERIAL PICKUP I S COMPLETE.

=====
Handling and Storage
=====

Handling and Storage Precautions:KEEP TIGHTLY CLOSED. HYGROSCOPIC.
STORE IN COOL DRY PLACE.
Other Precautions:DON'T BREATHE DUST. AVOID CONTACT W/EYES, SKIN &
CLOTHING. AVOID PROLONGED/REPEATED EXPOSURE.

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST REQUIRED.
Protective Gloves:CHEMICAL RESISTANT
Eye Protection:SAFETY GOGGLES
Other Protective Equipment:PROTECTIVE CLOTHING.
Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE. WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
WASTE CONT'D: THE HYDROLYSIS & NEUTRALIZATION REACTIONS MAY GENERATE
HEAT & FUMES WHICH CAN BE CONTROLLED BY THE RATE OF ADDITION.
DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.

=====
Physical/Chemical Properties
=====

Appearance and Odor:WHITE POWDER

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid: YES
STRONG ACIDS.
Stability Condition to Avoid: MOISTURE

===== Disposal Considerations =====

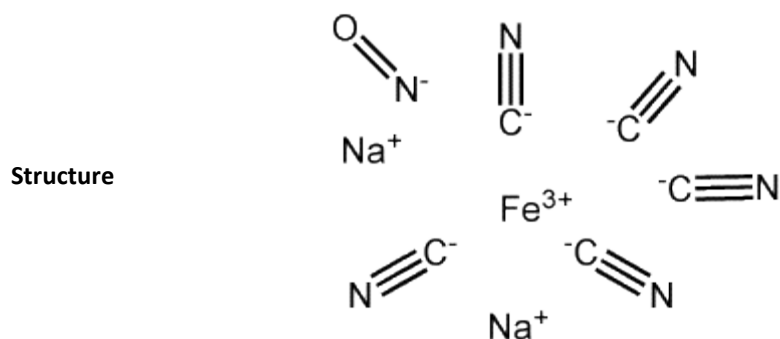
Waste Disposal Methods: SMALL QUANTITIES: CAUTIOUSLY ADD TO A LARGE
STIRRED EXCESS OF WATER. ADJUST THE PH TO NEUTRAL, SEPARATE ANY
INSOLUBLE SOLIDS/LIQUIDS & PACKAGE THEM FOR HAZARDOUS WASTE
DISPOSAL. FLUSH THE AQUEOUS SOLUTION DOWN THE DRAIN W/PLENTY OF
WATER. (SEE SUPP)

Disclaimer (provided with this information by the compiling agencies):
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of Defense. The United States of America in no manner whatsoever,
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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Sodium ferricyanide

- Disodium nitrosylpentacyanoferrate
- Nipride
- Sodium nitroprusside
- Sodium nitroferricyanide
- Sodium nitroprussate

Formula $\text{Na}_2[\text{Fe}(\text{CN})_5\text{NO}]$



Description Clear dark red solid.

Uses Reagent for the detection of many organic compds, e.G., Acetone, aldehydes, also of alkali sulfides, zinc, sulfur dioxide.

Registry Numbers and Inventories.

CAS 14402-89-2

NIH PubChem CID 24978522

EC (EINECS/ELINCS) 238-373-9

RTECS LJ8750000

RTECS class Agricultural Chemical and Pesticide; Drug; Mutagen; Reproductive Effector; Human Data

UN (DOT) 2811

Merck	12,8794
Beilstein/Gmelin	NA
Swiss Giftliste 1	G-2653
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	C ₅ FeN ₆ Na ₂ O
Formula mass	261.92
Density	1.72 g/cm ³ (20 C)

Hazards and Protection.

Storage	Store in a cool, dry place.
Handling	Wash thoroughly after handling. Wash hands before eating. Use only in a well ventilated area. Minimize dust generation and accumulation. Avoid ingestion and inhalation.
Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European

Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Small spills/leaks

Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

Stability

Stable under normal temperatures and pressures.

Incompatibilities

Strong oxidizing agents.

Decomposition

Nitrogen oxides, carbon monoxide, carbon dioxide, toxic fumes of sodium oxide.

Fire.

Fire fighting

Extinguish using agent most appropriate for surrounding fire.

Fire potential

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Hazards

Contact with metals may evolve flammable hydrogen gas.

Combustion products

Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure effects

Ingestion

Harmful if swallowed. May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation

Dust is irritating to the respiratory tract. May cause cardiac abnormalities.

Skin

May cause skin irritation.

Eyes

May cause eye irritation.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Skin Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Eyes Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 2811

Response guide [154](#)

Hazard class 6.1



Packing Group I; II; III

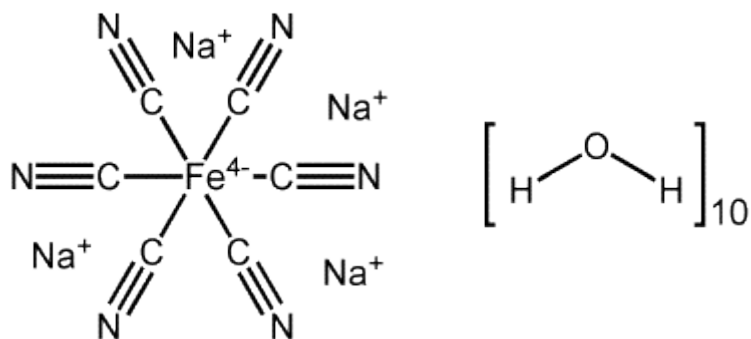
Sodium ferrocyanide decahydrate

- Sodium prussiate yellow
- Yellow prussiate of soda

Formula



Structure



Description

Odorless yellow solid.

Uses

In ore flotation, in photography for bleaching, toning and fixing, emulsion polymerization catalyst, to prevent caking of rock salt.

Registry Numbers and Inventories.

CAS	13601-19-9
NIH PubChem CID	61742
EC (EINECS/ELINCS)	237-081-9
RTECS	LJ8145000
RTECS class	Other
Merck	12,8760
Beilstein/Gmelin	NA
Swiss Giftlist 1	G-7840
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula



Formula mass	484.07
Melting point, °C	Approx. 50 (decomposes)
Decomposition point, °C	~50
Density	1.458 g/cm ³ (20 C)
Solubility in water	712 g/L (25 C)

Hazards and Protection.

Storage	Keep tightly closed in a cool place in a tightly closed container.
Handling	Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.
Protection	Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Wear resistant gloves. To prevent repeated or prolonged skin contact, wear impervious clothing and boots.
Respirators	If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions.
Small spills/leaks	Small Spill - Sweep up material for disposal or recovery. Large Spill - Shovel material into containers. Thoroughly sweep area of spill to clean up any residual material. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Stability	Stable.
Decomposition	Hydrogen cyanide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Extinguish using media most appropriate for surrounding fire.
Fire potential	Nonflammable.

Health.

Poison_Class	4
Exposure effects	Symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea) cyanosis (causes blue coloring of the skin and nails from lack of oxygen).
Ingestion	Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation This material is a dust or may produce dust. Breathing this material may be harmful or fatal. Symptoms may include severe irritation and burns to the nose, throat, and respiratory tract

Skin May cause mild skin irritation. Symptoms may include redness and burning of skin.

Eyes May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

First aid

Ingestion Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen. A cyanide antidote kit must be available at all times. Immediate first aid, including administration of oxygen and amyl nitrite, may be given by a trained layman. Medical treatment involves intravenous injection and must be administered by qualified medical personnel. Speed of treatment is very important. First aid given promptly is often the only treatment needed.

Skin Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse

Eyes Irrigate exposed eyes with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

Transportation.

USCG CHRIS Code

SFC

Material Safety Data Sheet

Sodium fluoride

ACC# 21230

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium fluoride

Catalog Numbers: AC191270000, AC191270010, AC191270250, AC191275000, AC201290000, AC201290250, AC201295000, AC424320000, AC424320050, AC424325000, S299-100, S299-3, S299-500

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-49-4	Sodium fluoride	>97	231-667-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white crystalline powder.

Danger! Causes irritation and possible burns by all routes of exposure. May be fatal if swallowed. Contact with acids liberates toxic gas. May cause lung damage. Moisture sensitive.

Target Organs: Kidneys, heart, gastrointestinal system, skeletal structures, teeth, nerves, bone.

Potential Health Effects

Eye: Causes eye irritation and possible burns. May cause chemical conjunctivitis and corneal damage.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May be fatal if swallowed. Ingestion of large amounts of fluoride may cause salivation, nausea, vomiting, abdominal pain, fever, labored breathing. Exposure to fluoride compounds can result in systemic toxic effects on the heart, liver, and kidneys. It may also deplete calcium levels in the body leading to hypocalcemia and death. May cause irritation of the digestive tract and possible burns. May cause respiratory paralysis and cardiac arrest.

Inhalation: May cause severe irritation of the respiratory tract with possible burns. Aspiration may lead to pulmonary edema. Prolonged exposure to dusts, vapors, or mists may result in the perforation of the nasal septum. May cause systemic effects.

Chronic: Chronic inhalation and ingestion may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Effects may be delayed. Chronic exposure may cause lung damage. Laboratory experiments have resulted in mutagenic effects. Chronic exposure to fluoride compounds may cause systemic toxicity. Skeletal effects may include bone brittleness, joint stiffness, teeth discoloration, tendon calcification, and osteosclerosis. Animal studies have reported the development of tumors.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Individuals who suffer from diabetes insipidus or some form of renal impairment may be at increased risk from the effects of fluoride. Due to delayed and persistent symptoms, observe patient closely for 48 hours. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Do NOT get water inside containers. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Do not flush into a sewer. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Do not allow contact with water. Discard contaminated shoes. Keep from contact with moist air and steam.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Store protected from moisture. Store away from alkalis.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium fluoride	2.5 mg/m ³ TWA (as F) (listed under Fluorides).	2.5 mg/m ³ TWA (as F) 250 mg/m ³ IDLH (as F)	2.5 mg/m ³ TWA (as dust) (listed under Fluorides). 2.5 mg/m ³ TWA (as F) (listed under Fluorides).

OSHA Vacated PELs: Sodium fluoride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white to off-white

Odor: odorless

pH: 7.4 (solution)

Vapor Pressure: 1 mm Hg @ 1077 deg C

Vapor Density: 1.45 (air=1)

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1704 deg C

Freezing/Melting Point: 993 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 2.78 (water=1)

Molecular Formula: NaF

Molecular Weight: 41.9882

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Moisture sensitive.

Conditions to Avoid: Incompatible materials, dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Moisture, acids, alkalies, glass, oxidizing agents.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, hydrogen fluoride gas, sodium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:**CAS#** 7681-49-4: WB0350000**LD50/LC50:**

CAS# 7681-49-4:

Draize test, rabbit, eye: 20 mg/24H Moderate;

Oral, mouse: LD50 = 44 mg/kg;

Oral, rabbit: LD50 = 200 mg/kg;

Oral, rat: LD50 = 31 mg/kg;

Carcinogenicity:

CAS# 7681-49-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Oral, rat: TDLo = 617 mg/kg/2Y-C (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Endocrine - thyroid tumors and Musculoskeletal - tumors.; Oral, mouse: TDLo = 14 mg/kg/43W-C (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Skin and Appendages - tumors.**Teratogenicity:** Oral, rat: TDLo = 240 mg/kg (female 11-14 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system.; Oral, rat: TDLo = 255 mg/kg (female 85 day(s) pre-mating) Specific Developmental Abnormalities - Central Nervous System.; Intraperitoneal, rat: TDLo = 9 mg/kg (female 10-18 day(s) after conception) Effects on Embryo or Fetus - extra-embryonic structures (e.g., placenta, umbilical cord) and Effects on Embryo or Fetus - fetal death.**Reproductive Effects:** Oral, rat: TDLo = 150 mg/kg (male 30 day(s) pre-mating) Reproductive - Paternal Effects - spermatogenesis (incl. genetic material, sperm morphology, motility, and count) and Paternal Effects - testes, epididymis, sperm duct and Fertility - male fertility index (e.g. # males impregnating females per # males exposed to fertile nonpregnant females).; Oral, rat: TDLo = 221 mg/kg (female 1-20 day(s) after conception) Fertility - post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).**Mutagenicity:** DNA Inhibition: Human, Fibroblast = 100 mg/L.; Cytogenetic Analysis: Human, Fibroblast = 20 mg/L.; Cytogenetic Analysis: Human, Lymphocyte = 20 mg/L.; Mutation in Mammalian Somatic Cells: Human, Lymphocyte = 440 mg/L.**Neurotoxicity:** No information found**Other Studies:**

Section 12 - Ecological Information

Ecotoxicity: Fish: Mosquito Fish: TLm = 419 ppm; 96 Hr; Fresh water Water flea Daphnia: LC50 = 340 mg/L; 48 Hr; Unspecified No data available.**Environmental:** Toxic to aquatic and plant life. Soil can bind fluorides tightly if the pH is greater than 6.5. Fluorides can be damaging to plants when present in acid soils.**Physical:** No information available.**Other:** Dangerous to aquatic life in high concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	SODIUM FLUORIDE, SOLID	SODIUM FLUORIDE
Hazard Class:	6.1	6.1
UN Number:	UN1690	UN1690
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-49-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7681-49-4: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7681-49-4: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7681-49-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7681-49-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Fluorides, inorganic), Minnesota, (listed as Fluorides), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 25 Toxic if swallowed.

R 32 Contact with acids liberates very toxic gas.

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 22 Do not breathe dust.

S 36 Wear suitable protective clothing.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7681-49-4: 1

Canada - DSL/NDSL

CAS# 7681-49-4 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7681-49-4 is listed on the Canadian Ingredient Disclosure List.

SIGMA CHEMICAL CO -- B-GLYCEROPHOSPHATE DISODIUM HYDRATE, G6251 --
6810-00N064475

=====
Product Identification
=====

Product ID:B-GLYCEROPHOSPHATE DISODIUM HYDRATE, G6251
MSDS Date:04/05/1991
FSC:6810
NIIN:00N064475
MSDS Number: BZLZR
=== Responsible Party ===
Company Name:SIGMA CHEMICAL CO
Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Info Phone Num:800-325-3010
Emergency Phone Num:314-771-5765
CAGE:0DK69

==== Contractor Identification ====

Company Name:SIGMA CHEMICAL CO SIGMA DIAGNOSTICS DIV
Address:3050 SPRUCE ST
Box:City:ST LOUIS
State:MO
ZIP:63103-2530
Country:US
Phone:314-771-5765
CAGE:0DK69

=====
Composition/Information on Ingredients
=====

Ingred Name:B-GLYCEROPHOSPHATE DISODIUM HYDRATE
OSHA PEL:N/K
ACGIH TLV:N/K

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:MAY BE HARMFUL BY INHALATION,
INGESTION OR SKIN ABSORPTION. MAY CAUSE EYE IRRITATION. MAY CAUSE
SKIN IRRITATION. TO THE BEST OF MFR'S KNOWLEDGE, THE CHEMICAL,
PHYSICAL & TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY
INVESTIGATED.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:EYES:IMMEDIATELY FLUSH W/COPIOUS AMOUNTS OF WATER FOR AT
LEAST 15 MINUTES. SKIN:IMMEDIATELY WASH W/SOAP & COPIOUS AMOUNTS OF
WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE. INHAL:REMOVE TO
FRESH AIR. IF NOT BREATHING GIVE ARTF RESP. IF BREATHING IS
DIFFICULT, GIVE OXYGEN. INGEST:WASH OUT MOUTH W/WATER PROVIDED

PERSON IS CONSCIOUS. CALL MD.

=====
===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER,
ALCOHOL OR POLYMER FOAM.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT .
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR NIOSH/MSHA APPROVED RESPIRATOR, CHEMICAL
SAFETY GOGGLES, RUBBER BOOTS & HEAVY RUBBER GLOVES. SWEEP UP, PLACE
IN A BAG & HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE
AREA & WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:AVOID INHALATION. AVOID CONTACT
W/EYES, SKIN & CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE. KEEP
TIGHTLY CLOSED. STORE IN A COOL, DRY PLACE.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST REQUIRED.
Protective Gloves:COMPATIBLE CHEMICAL-RESISTANT GLOVES.
Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .
Other Protective Equipment:EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET
ANSI DESIGN CRITERIA .
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

=====
===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:>216F,>102C
Appearance and Odor:WHITE POWDER.

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:TOXIC FUMES OF: CARBON MONOXIDE,
CARBON DIOXIDE. THERMAL DECOMP MAY PRODUCE TOX FUMES OF PHOSPHORUS
OXIDES &/OR PHOSPHINE.

=====
===== Disposal Considerations =====

Waste Disposal Methods:DISSOLVE OR MIX MATERIAL W/COMBUSTIBLE SOLVENT &
BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.
OBSERVE ALL FEDERAL, STATE & LOCAL ENVIRONMENTAL REGULATIONS.

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Material Safety Data Sheet

Sodium iodate

ACC# 21335

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium iodate

Catalog Numbers: AC201760000, AC201761000, AC201765000, AC419560050, AC419565000, NC9048278, NC9626448, S322-100, S76798

Synonyms: Iodic acid, sodium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-55-2	Sodium iodate	>99	231-672-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine crystalline powder.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. Harmful if swallowed.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. May cause eye injury.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. May be harmful if inhaled.

Chronic: Prolonged or repeated exposure may cause gastrointestinal irritation and kidney damage. Chronic exposure can lead to iodism characterized by headache, excess salivation, nasal discharge, conjunctivitis, laryngitis, bronchitis, stomatitis, enlarged submaxillary glands, and skin rashes. Chronic ingestion may cause central nervous system failure.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes. Use water with caution and in flooding amounts. Oxidizer. Greatly increases the burning rate of combustible materials. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam. Contact professional fire-fighters immediately.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation.

Storage: Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium iodate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium iodate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white - fine
Odor: odorless
pH: Neutral in sol.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not applicable.
Freezing/Melting Point: Decomposes
Decomposition Temperature: Not available.
Solubility: Soluble in water.
Specific Gravity/Density: 4.28
Molecular Formula: INaO3
Molecular Weight: 197.89

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated.

Conditions to Avoid: High temperatures, dust generation, combustible materials, organic materials.

Incompatibilities with Other Materials: Strong reducing agents, finely powdered metals, hydrogen peroxide, sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), combustible materials, flammable liquids.

Hazardous Decomposition Products: Hydrogen iodide, sodium oxide, iodine.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7681-55-2: NN1400000

LD50/LC50:

CAS# 7681-55-2:

Oral, mouse: LD50 = 505 mg/kg;

Carcinogenicity:

CAS# 7681-55-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, N.O.S.	OXIDIZING SOLID NOS (SODIUM IODATE)
Hazard Class:	5.1	5.1
UN Number:	UN1479	UN1479
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-55-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7681-55-2: immediate, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7681-55-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7681-55-2: 1

Canada - DSL/NDSL

CAS# 7681-55-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sodium Iodide

ACC# 91778

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Iodide

Catalog Numbers: S75213, S75214, S75215, S93372

Synonyms: Sodium Monoiodide; Sodium Iodine; Anayodin.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-82-5	Sodium Iodide	ca. 100	231-679-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause respiratory and digestive tract irritation. May cause eye and skin irritation. Prolonged exposure may cause pulmonary edema. This substance has caused adverse reproductive and fetal effects in animals. Air sensitive. Light sensitive. Moisture sensitive.

Target Organs: None.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and

cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated exposure may cause adverse reproductive effects. Chronic exposure can lead to iodism characterized by salivation, nasal discharge, sneezing, conjunctivitis, fever, laryngitis, bronchitis, stomatitis, and skin rashes. Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Store protected from light. Handle under an inert atmosphere. Store protected from air. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Store in a cool place in the original container and protect from sunlight. Do not store in direct sunlight. Store in a tightly closed container. Do not expose to air. Store protected from moisture. Store protected from light. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium Iodide	none listed	none listed	none listed

OSHA Vacated PELs: Sodium Iodide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Not available.

pH: Not available.

Vapor Pressure: 1.3 mbar @ 767 deg

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 1300 deg C @ 760.00mm Hg

Freezing/Melting Point:661 deg C

Decomposition Temperature:Not available.

Solubility: 1790 G/L (20°C)

Specific Gravity/Density:3.6670g/cm3

Molecular Formula:INa

Molecular Weight:149.89

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light, moisture, exposure to air, contact with water, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, hydrogen iodide, sodium oxide, iodine.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7681-82-5: WB6475000

LD50/LC50:

CAS# 7681-82-5:

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Moderate;

Oral, mouse: LD50 = 1000 mg/kg;

Oral, rat: LD50 = 4340 mg/kg;

Carcinogenicity:

CAS# 7681-82-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: See RTECS for actual entry.

Reproductive Effects: See RTECS for actual entry.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: This chemical is expected to cause little oxygen depletion in aquatic systems. Fathead minnow, LC50: 3200ng/L (96H), Water flea, LC50: 3.3mg/L (96H), Golden orfe, LC50: 10,000mg/L. This chemical is not likely to bioconcentrate.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-82-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7681-82-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7681-82-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7681-82-5: 1

Canada - DSL/NDSL

CAS# 7681-82-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7681-82-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium metabisulfite

ACC# 21370

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium metabisulfite

Catalog Numbers: AC171490000, AC171490025, AC419580000, AC419580010, AC419580050, S242-12, S242-212, S242-400LB, S242-500, S243-10, S244-3, S244-500

Synonyms: Sodium pyrosulfite; Disodium disulfite; Pyrosulfurous acid, disodium salt; Disodium metabisulfite; Disodium pyrosulfite.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-57-4	Sodium metabisulfite	>97	231-673-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to yellow solid.

Danger! May cause allergic respiratory and skin reaction. May cause severe eye irritation and possible injury. May be harmful if swallowed. May cause skin and respiratory tract irritation. Contact with acids liberates toxic gas, sulfur dioxide. Slowly oxidized to the sulfate on exposure to air and moisture. Corrosive to aluminum in aqueous solution.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: May cause severe eye irritation and possible injury.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause an

allergic reaction in certain individuals.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. Sulfite compounds may cause a severe allergic reaction in sensitive individuals and some asthmatics. Sodium metabisulfite used as a preservative in vinegar provoked severe asthma in a 67-year-old woman who ate salad with vinegar-based dressing. (ACGIH Documentation of the TLVs)

Inhalation: May cause allergic respiratory reaction. May cause effects similar to those described for ingestion. Inhalation of dust may cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Use water fog, dry chemical, carbon dioxide, or regular foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Avoid breathing dust. Do not get in eyes. Avoid contact with skin and clothing.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Do not store in aluminum containers. Store protected from moisture. Keep away from oxidizing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium metabisulfite	5 mg/m ³ TWA	5 mg/m ³ TWA	none listed
Sulfur dioxide	2 ppm TWA; 5 ppm STEL	2 ppm TWA; 5 mg/m ³ TWA 100 ppm IDLH	5 ppm TWA; 13 mg/m ³ TWA

OSHA Vacated PELs: Sodium metabisulfite: 5 mg/m³ TWA Sulfur dioxide: 2 ppm TWA; 5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white to yellow
Odor: sulfur dioxide odor
pH: acid in soln
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:150 deg C
Decomposition Temperature:150 deg C
Solubility: Soluble.
Specific Gravity/Density:1.4
Molecular Formula:Na₂S₂O₅
Molecular Weight:190.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Slowly oxidized to the sulfate on exposure to air and moisture.

Conditions to Avoid: Dust generation, moisture, exposure to air, excess heat, Corrosive to aluminum in aqueous solution..

Incompatibilities with Other Materials: Strong oxidizing agents, acids.

Hazardous Decomposition Products: Oxides of sulfur, toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7681-57-4: UX8225000

CAS# 7446-09-5: WS4550000

LD50/LC50:

CAS# 7681-57-4:

Dermal, guinea pig: LD50 = >1 gm/kg;

Draize test, rabbit, eye: 100 mg/24H Mild;

Draize test, rabbit, skin: 500 mg;

Oral, rat: LD50 = 1131 mg/kg;

Skin, rat: LD50 = >2 gm/kg;

CAS# 7446-09-5:

Draize test, rabbit, eye: 6 ppm/32D Mild;

Inhalation, mouse: LC50 = 3000 ppm/30M;

Inhalation, rat: LC50 = 2520 ppm/1H;

Inhalation, rat: LC50 = 2168 mg/m³;

Carcinogenicity:

CAS# 7681-57-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7446-09-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Two cases of occupational asthma in laundry workers exposed to sodium metabisulfite were reported. Sodium metabisulfite may be considered to be the anhydride of sodium bisulfite and is the chief constituent of commercial dry sodium bisulfite.

Teratogenicity: No information found

Reproductive Effects: See actual entry in RTECS for complete information.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-57-4 is listed on the TSCA inventory.

CAS# 7446-09-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

CAS# 7446-09-5: 500 lb TPQ

SARA Codes

CAS # 7681-57-4: immediate.

CAS # 7446-09-5: immediate, sudden release of pressure.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

CAS# 7446-09-5 is considered highly hazardous by OSHA.

STATE

CAS# 7681-57-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7446-09-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 31 Contact with acids liberates toxic gas.

R 41 Risk of serious damage to eyes.

Safety Phrases:

- S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S 39 Wear eye/face protection.
- S 46 If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

- CAS# 7681-57-4: 1
- CAS# 7446-09-5: 1

Canada - DSL/NDSL

- CAS# 7681-57-4 is listed on Canada's DSL List.
- CAS# 7446-09-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

- CAS# 7681-57-4 is listed on the Canadian Ingredient Disclosure List.
- CAS# 7446-09-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium metaborate tetrahydrate, p.a.

ACC# 52694

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium metaborate tetrahydrate, p.a.

Catalog Numbers: AC211630000, AC211630025, AC211630250, AC211635000

Synonyms: None.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10555-76-7	Sodium metaborate tetrahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white granular powder.

Caution! The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Wash mouth out with water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium metaborate tetrahydrate	none listed	none listed	none listed
Sodium metaborate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Sodium metaborate tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Sodium metaborate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white granular

Odor: Not available.

pH: alkaline in water

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 57 deg C

Decomposition Temperature: Not available.

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: BNaO₂.4H₂O

Molecular Weight: 137.86

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants..

Hazardous Decomposition Products: No data available.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10555-76-7 unlisted.

CAS# 7775-19-1: ED4640000

LD50/LC50:

Not available.

CAS# 7775-19-1:

Oral, rat: LD50 = 2330 mg/kg;

Carcinogenicity:

CAS# 10555-76-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7775-19-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Insecticidal and fungicidal.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10555-76-7 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7775-19-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10555-76-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7775-19-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 10555-76-7: No information available.

CAS# 7775-19-1: 1

Canada - DSL/NDSL

CAS# 7775-19-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sodium metaphosphate

ACC# 21260

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium metaphosphate

Catalog Numbers: 61217-5000, S333-500

Synonyms: Metaphosphoric acid hexasodium salt; Sodium hexametaphosphate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10124-56-8	Sodium metaphosphate	app.100	233-343-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white solid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Do not let this chemical enter the environment. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium metaphosphate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium metaphosphate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to white

Odor: odorless

pH: 6.0 - 7.7 solution.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: 640 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 2.181

Molecular Formula: (NaPO₃)₆

Molecular Weight: 611.77

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Oxides of phosphorus, toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10124-56-8: OY3675000

LD50/LC50:

CAS# 10124-56-8:

Oral, mouse: LD50 = 4320 mg/kg;

Oral, rat: LD50 = 6200 mg/kg;

Carcinogenicity:

CAS# 10124-56-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste

regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10124-56-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10124-56-8: 5000 lb final RQ (listed under Sodium phosphate, tribasic); 2270 kg final RQ (li

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10124-56-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10124-56-8 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10124-56-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 10124-56-8: 1

Canada - DSL/NDSL

CAS# 10124-56-8 is listed on Canada's DSL List.

Canada - WHMIS

not available.

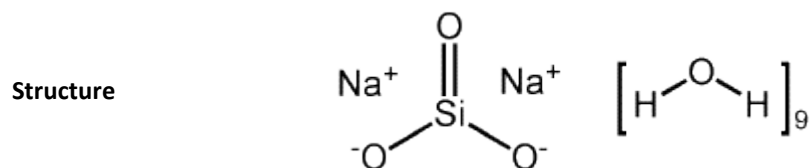
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Sodium metasilicate nonahydrate

- Disodium oxosilanediolate nonahydrate

Formula $\text{Na}_2\text{SiO}_3 \cdot 9\text{H}_2\text{O}$



Description Colorless or white solid.

Registry Numbers and Inventories.

CAS 13517-24-3

NIH PubChem CID 61639

EC (EINECS/ELINCS) 603-903-3

UN (DOT) 1759

Beilstein/Gmelin 190963 (G)

New Zealand Listed

Japan ENCS (MITI) Listed

Philippiens PICCS Listed

Properties.

Formula $\text{H}_{18}\text{Na}_2\text{O}_{12}\text{Si}$

Formula mass 284.20

Melting point, °C	40
Density	2.62 g/cm ³ (21 C)
Solubility in water	Readily soluble

Hazards and Protection.

Storage	Keep away from heat, sparks, and flame. Store in a cool, dry place. Keep container closed when not in use. Corrosives area.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Use with adequate ventilation. Discard contaminated shoes.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong acids, strong oxidizing agents.
Decomposition	Irritating and toxic fumes and gases, silicon oxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH
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(approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Fire potential

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Hazards

Contact with metals may evolve flammable hydrogen gas.

Combustion products

Fire may produce irritating, corrosive and/or toxic gases.

NFPA

Health 3

Flammability 0

Reactivity 0

Health.

Exposure effects

Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Effects may be delayed. Chronic inhalation may cause lung damage, bronchitis, and silicosis. May decrease blood clotting. Prolonged exposure to respirable crystalline quartz may cause delayed lung injury/fibrosis (silicosis).

Ingestion

May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause perforation of the digestive tract. May cause systemic effects.

Inhalation

Causes chemical burns to the respiratory tract. Aspiration may lead to pulmonary edema. May cause systemic effects. Contains crystalline silica which may lead to respiratory abnormalities and silicosis.

Skin

Causes skin burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Eyes

Causes eye burns. May cause chemical conjunctivitis and corneal damage.

First aid

Ingestion	Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation	Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Skin	Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Eyes	Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation is required (at least 30 minutes).

Transportation.

UN number	1759
Response guide	154
Hazard class	8
Packing Group	I; II; III



Material Safety Data Sheet

Sodium Molybdate Dihydrate

ACC# 95022

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Molybdate Dihydrate

Catalog Numbers: S336-3, S336-500

Synonyms: Molybdic Acid Sodium Dihydrate; Disodium Molybdate Dihydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10102-40-6	Sodium molybdate dihydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: Causes respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Use with

adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium molybdate dihydrate	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).
Sodium molybdate	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).

OSHA Vacated PELs: Sodium molybdate dihydrate: No OSHA Vacated PELs are listed for this chemical. Sodium molybdate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: Not applicable.

Vapor Pressure: Not applicable.

Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: Not applicable.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density: 3.28
Molecular Formula: Na₂MoO₄·2H₂O
Molecular Weight: 241.944

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10102-40-6: QA5085000

CAS# 7631-95-0: QA5075000

LD50/LC50:

Not available.

CAS# 7631-95-0:

Inhalation, rat: LC50 = >2080 mg/m³/4H;

Oral, rat: LD50 = 4 gm/kg;

Oral, rat: LD50 = 0.25 gm/kg;

Carcinogenicity:

CAS# 10102-40-6:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 7631-95-0:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10102-40-6 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7631-95-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7631-95-0: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10102-40-6 can be found on the following state right to know lists: California, (listed as Molybdenum compounds, n.o.s.), Minnesota, (listed as Molybdenum soluble compounds).

CAS# 7631-95-0 can be found on the following state right to know lists: Minnesota, (listed as Molybdenum soluble compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 10102-40-6: 1

CAS# 7631-95-0: 1

Canada - DSL/NDSL

CAS# 7631-95-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10102-40-6 (listed as Molybdenum compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 7631-95-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium Nitrate

ACC# 21400

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Nitrate

Catalog Numbers: AC205960000, AC205960010, AC205962500, AC424340000, AC424340030, 42434-5000, BP360-500, NC9151300, NC9528513, S342-3, S343-3, S343-500, S71998-1

Synonyms: Cubic niter; Soda niter; Chile saltpeter.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7631-99-4	Sodium nitrate	100	231-554-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. Harmful if swallowed. May cause methemoglobinemia.

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of

the blood), convulsions, and death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.

Inhalation: Causes respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death.

Chronic: Sodium nitrate may react with secondary or tertiary amines to form nitrosamines (certain nitrosamines are cancer suspect agents).

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use water only!

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Use only in a chemical fume hood. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium nitrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white
Odor: Odorless
pH: 5.5-8.0 (5% aq. solution)
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 380 deg C
Freezing/Melting Point:306 deg C
Decomposition Temperature:380 deg C
Solubility: Soluble.
Specific Gravity/Density:900 g/l (20°C)
Molecular Formula:NNaO3
Molecular Weight:84.99

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Organic materials, combustible materials, reducing agents, easily oxidizable materials, finely powdered metals, fluorine, cyanides.
Hazardous Decomposition Products: Oxides of nitrogen, oxygen.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 7631-99-4: WC5600000
LD50/LC50:
CAS# 7631-99-4:
Oral, mouse: LD50 = 3500 mg/kg;
Oral, rabbit: LD50 = 2680 mg/kg;
Oral, rat: LD50 = 1267 mg/kg;

Carcinogenicity:
CAS# 7631-99-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: See actual RTECS.
Teratogenicity: No information found
Reproductive Effects: orl-mus TDLO: 16800 mg/kg (14D male)
Mutagenicity: Mutagenic effects have occurred in humans.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. This material will not cause oxygen depletion in aquatic systems. It has a low potential to affect aquatic organisms, secondary waste treatment microorganisms, and the growth of some plants. It has a moderate potential to affect the germination of some plants. Acute aquatic effects: 96-hour LC50; Fathead minnow: GT 1000 mg/L 96-hour LC50; Water flea: GT 1000 mg/L

Environmental: Nitrates are predominantly used as fertilizer. Unfortunately, nitrates have a tendency to migrate into groundwater as they do not bind to soil and are extremely soluble. Excessive levels of nitrates in drinking water may cause serious illness and death. Infants are most susceptible to nitrate toxicity. "Blue Baby Syndrome" can occur when the infant's conversion of nitrate to nitrite interferes with the oxygen-carrying capacity of the blood. Symptoms of Blue Baby Syndrome include, but may not be limited to, shortness of breath and bluish colored skin.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	SODIUM NITRATE	SODIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1498	UN1498
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7631-99-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7631-99-4: immediate, delayed, fire.

Section 313

This material contains Sodium nitrate (listed as Water Dissociable Nitrate Compounds), 100%, (CAS# 7631-99-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7631-99-4 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7631-99-4: 1

Canada - DSL/NDSL

CAS# 7631-99-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7631-99-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium nitrite

ACC# 21410

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium nitrite

Catalog Numbers: AC196620000, AC196620025, AC217600000, AC217600010, AC424350000, AC424350020, AC424350050, 42435-5000, NC9151301, NC9790812, S338-3, S347-10, S347-250, S347-3, S347-500

Synonyms: Nitrous acid, sodium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7632-00-0	Sodium nitrite	>97	231-555-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light yellow crystals.

Danger! May be fatal if inhaled. Strong oxidizer. Contact with other material may cause a fire. Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause methemoglobinemia. This substance has caused adverse reproductive and fetal effects in animals. Air sensitive. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, cardiovascular system, smooth muscle.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Causes skin irritation. May be absorbed through the skin.

Ingestion: Harmful if swallowed. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Causes digestive tract irritation. Ingestion may cause weakness, muscular incoordination, fine tremors, loss of reflexes, convulsions and possible death from circulatory collapse. Ingestion may cause a decrease in blood pressure, rapid pulse and visual disturbances.

Inhalation: May be fatal if inhaled. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Animal studies have reported the development of tumors. Sodium nitrate may react with secondary or tertiary amines to form nitrosamines (certain nitrosamines are cancer suspect agents).

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. SPEED IS ESSENTIAL, OBTAIN MEDICAL AID IMMEDIATELY.

Notes to Physician: Absorption of this product into the body may cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). Moderate degrees of cyanosis need to be treated only by supportive measures: bed rest and oxygen inhalation. If cyanosis is severe, intravenous injection of Methylene Blue, 1mg/kg of body weight may be of value.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Use water with caution and in flooding amounts. May explode from heat or contamination. May accelerate burning if involved in a fire.

Extinguishing Media: Use water only! Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For large fires, flood fire area with water from a distance. Do NOT use dry chemicals, CO₂, Halon or foams.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Handle under an inert atmosphere. Store protected from air. Use only in a chemical fume hood.

Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from moisture. Store under an inert atmosphere. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium nitrite	none listed	none listed	none listed

OSHA Vacated PELs: Sodium nitrite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white to light yellow

Odor: odorless

pH: ~ 9

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 320 deg C

Freezing/Melting Point: 271 deg C

Decomposition Temperature: 320 deg C

Solubility: Soluble.

Specific Gravity/Density: 2.168

Molecular Formula: NaNO₂

Molecular Weight: 69

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Unstable if heated, may explode at temperatures greater than 533°C.

Conditions to Avoid: Ignition sources, dust generation, exposure to air, exposure to moist air or water, temperatures above 320°C.

Incompatibilities with Other Materials: Reducing agents, acids, amines, chlorates, permanganates, cyanides (e.g. potassium cyanide, sodium cyanide), metals as powders (e.g. hafnium, raney nickel), hypophosphites, sulfites, tannic acid, organic matter, antipyrine, ammonium salts, acetanilide, iodides, mercury salts, moisture, air, activated carbon, vegetable astringents.

Hazardous Decomposition Products: Oxides of nitrogen, irritating and toxic fumes and gases.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:**CAS#** 7632-00-0: RA1225000; RA1425000**LD50/LC50:**

CAS# 7632-00-0:

Draize test, rabbit, eye: 500 mg/24H Mild;

Inhalation, rat: LC50 = 5.5 mg/m³/4H;

Oral, mouse: LD50 = 175 mg/kg;

Oral, rabbit: LD50 = 186 mg/kg;

Oral, rat: LD50 = 180 mg/kg;

Carcinogenicity:

CAS# 7632-00-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Oral, rat: TDLo = 2190 gm/kg/2Y-C (Tumorigenic - Carcinogenic by RTECS criteria - Gastrointestinal - tumors).; Oral, rat: TD = 91 gm/kg/2Y-C (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Skin and Appendages - tumors and Reproductive - Tumorigenic effects - testicular tumors).; Oral, rat: TD = 40 gm/kg/56W-C - (Tumorigenic - neoplastic by RTECS criteria - Liver - tumors).**Teratogenicity:** Oral, rat: TDLo = 660 mg/kg (female 1-22 day(s) after conception) Effects on Embryo or Fetus - fetal death and Effects on Newborn - growth statistics (e.g. %, reduced weight gain).; Oral, rat: TDLo = 10280 mg/kg (female 1-22 day(s) after conception and lactating female 20 day(s) post-birth) Effects on Newborn - weaning or lactation index (e.g., # alive at weaning per # alive at day 4).; Oral, mouse: TDLo = 280 mg/kg (female 1-14 day(s) after conception) Specific Developmental Abnormalities - blood and lymphatic systems (including spleen and marrow).**Reproductive Effects:** Oral, mouse: TDLo = 1200 mg/kg (female 6-15 day(s) after conception) Fertility - pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea).; Oral, mouse: TDLo = 1680 mg/kg (male 14 day(s) pre-mating) Fertility - male fertility index (e.g. # males impregnating females per # males exposed to fertile nonpregnant females).; Oral, mouse: TDLo = 840 mg/kg (male 14 day(s) pre-mating) Paternal Effects - spermatogenesis (incl. genetic material, sperm morphology, motility, and count).**Mutagenicity:** Unscheduled DNA Synthesis: Human, HeLa cell = 6 mmol/L.; DNA Inhibition: Human, Fibroblast = 2000 ppm.; DNA Inhibition: Human Cells - not otherwise specified = 725 umol/L.**Neurotoxicity:** No information found**Other Studies:**

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.19-0.39 mg/L; 96 Hr; Flow-through bioassay Fish: Mosquito Fish: TLm = 8.1 ppm; 24 Hr; Highly turbid water Fish: Creek chub: Critical range = 400-2000 ppm; 24 Hr; Detroit River No data available.**Environmental:** In water sodium nitrite dissociates completely and under aerobic conditions the nitrite ions are oxidized to nitrates.

Physical: No information available.

Other: Harmful to aquatic life in very low concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	SODIUM NITRITE	SODIUM NITRITE
Hazard Class:	5.1	5.1(6.1)
UN Number:	UN1500	UN1500
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7632-00-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7632-00-0: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7632-00-0: immediate, delayed, fire.

Section 313

This material contains Sodium nitrite (CAS# 7632-00-0, >97%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7632-00-0 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7632-00-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T O N

Risk Phrases:

R 25 Toxic if swallowed.

R 8 Contact with combustible material may cause fire.

R 50 Very toxic to aquatic organisms.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7632-00-0: 2

Canada - DSL/NDSL

CAS# 7632-00-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7632-00-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium oxalate

ACC# 21450

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium oxalate

Catalog Numbers: AC207720000, AC207720050, AC207721000, AC207725000, AC270540000, AC270540010, AC270540050, BP353-500, S487-500

Synonyms: Ethanedioic acid, disodium salt; Oxalic acid, disodium salt; Disodium oxalate; Sodium oxalate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
62-76-0	Sodium oxalate	> 99.5	200-550-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause kidney damage. Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, heart, eyes, skin, brain, nerves, mucous membranes.

Potential Health Effects

Eye: Causes eye irritation. May result in corneal injury.

Skin: Oxalate is an irritant and may cause dermatitis. Skin lesions begin with epithelial cracking and the formation of slow-healing ulcers. The fingers may appear cyanotic.

Ingestion: Ulcerations of the mouth, vomiting of blood, and rapid appearance of shock,

convulsions, twitching, tetany, and cardiovascular collapse may occur following ingestion of oxalic acid or its soluble salts. Systemic effects may be due to formation of calcium oxalate which is insoluble at physiological pH and can be deposited in the brain and kidney tubules. Resultant hypocalcemia might disturb the function of the heart and nerves. Mean lethal dose for oxalates in adults is estimated at 10 - 30 grams (143 - 428 mg/kg).

Inhalation: Inhalation of oxalic acid dust or vapor produces irritation of the respiratory tract, protein in the urine, nosebleed, ulceration of the mucous membranes, headache, nervousness, cough, vomiting, emaciation, back pain (due to kidney injury), and weakness.

Chronic: Inhalation of oxalic acid dust or mist over a long period of time might result in weight loss and respiratory tract inflammation. Rats administered oxalic acid at 2.5 and 5% in the diet for 70 days developed depressed thyroid function and weight loss. A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: Intravenous administration of calcium gluconate or calcium chloride may be required if hypocalcemia or hypocalcemic tetany occur.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Oxalates slowly corrode steel.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium oxalate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium oxalate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: odorless
pH: Neutral in solution.
Vapor Pressure: Negligible.
Vapor Density: Not applicable.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Decomposes
Freezing/Melting Point: 250 - 270 deg C
Decomposition Temperature: 250 - 270 deg C
Solubility: Moderately soluble in water.
Specific Gravity/Density: 2.34 (water=1)
Molecular Formula: C₂O₄Na₂
Molecular Weight: 134

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, dust generation, moisture, Oxalates slowly corrode steel.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, sodium oxide, formic acid.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 62-76-0: K11750000
LD50/LC50:
CAS# 62-76-0:
Oral, mouse: LD50 = 5094 mg/kg;
Oral, rat: LD50 = 11160 mg/kg;

Mean lethal dose for oxalates in adults is estimated at 10-30 grams (143-428 mg/kg).

Carcinogenicity:
CAS# 62-76-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: A study of railroad car cleaners in Norway who were heavily exposed to oxalic acid solutions and vapors revealed a 53% prevalence of urolithiasis (the formation of urinary stones), compared to a rate of 12% among unexposed workers from the same company.

Teratogenicity: No information found

Reproductive Effects: Oxalic acid caused kidney damage in fetal sheep and rats and disturbed the estrus cycle in rats. Increased sperm abnormalities were seen in the second generation of mice administered 0.2% oxalic acid in the drinking water.

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	Toxic Solid, Organic, N.O.S.
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 62-76-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 62-76-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 62-76-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 62-76-0: 1

Canada - DSL/NDSL

CAS# 62-76-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

EMS CATALOG NO: 21190
EMS PRODUCT: Sodium Phosphate Monobasic
DATE: 04/11/95
PAGE NUMBER: One of 6

MATERIAL SAFETY DATA SHEET

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

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FORT WASHINGTON, PA 19034 24 HOUR EMERGENCY PHONE NUMBER
(215) 646-1566 CHEMTREC: (800) 424-9300

FOR PRODUCT AND SALES INFORMATION

CONTACT ELECTRON MICROSCOPY SCIENCES OFFICE ABOVE.

PRODUCT IDENTIFICATION

PRODUCT NAME: Sodium Phosphate, Monobasic

CAS NUMBER: 7558-80-7

TRADE NAMES/SYNONYMS:

Monosodium phosphate; Sodium dihydrogen phosphate;
Monosodium dihydrogen phosphate; Sodium biphosphate;
Acid sodium phosphate; Monosodium orthophosphate; MSP;
Phosphoric Acid, Monosodium Salt; Dihydrogen Sodium
Phosphate; Monobasic Sodium Phosphate; Monosodium
Hydrogen Phosphate; Sodium diphosphate anhydrous; Sodium
dihydrogen, monophosphate; Sodium dihydrogen orthophosphate; Sodium
phosphate (NA(H₂P₀₄)); Sodium primary phosphate; Sodium phosphate;
NaH₂PO₄; OHS15190

CHEMICAL FAMILY: Inorganic salt

MOLECULAR FORMULA: NaH₂PO₄

MOLECULAR WEIGHT: 119.98

CERCLA RATING (SCALE 0-3): NFPA RATINGS (SCALE 0-4):

HEALTH=3 HEALTH=U
FIRE=1 FIRE=1
REACTIVITY=0 REACTIVITY=0
PERSISTENCE=0

COMPONENTS AND CONTAMINANTS

COMPONENT: Sodium phosphate, monobasic
PERCENT: 100
OTHER CONTAMINANTS: None
EXPOSURE LIMITS: No occupational exposure limits established by OSHA, ACGIH, or NIOSH.

PHYSICAL DATA

DESCRIPTION: White, crystalline powder.
MELTING POINT: 437oF (225oC) (Decomposes)
SPECIFIC GRAVITY: Approx. 2.0
VAPOR PRESSURE: Negligible PH: 4.5 @ 0.1 m soln.
SOLUBILITY IN WATER: Very soluble
SOLVENT SOLUBILITY: Very slightly soluble in ether, chloroform, toluene; insoluble in alcohol.

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:

Slight fire hazard when exposed to heat or flame.

FIREFIGHTING MEDIA:

Dry chemical, carbon dioxide, halon, water spray or standard foam (1990 Emergency Response Guidebook, DOT P 5800.5).

For larger fires, use water spray, fog or standard foam (1990 Emergency Response Guidebook, DOT P 5800.5).

Move container from fire area if possible. Do not scatter spilled material with high pressure water streams. Dike fire control water for later disposal (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 31).

Use agents suitable for type of surrounding fire. Avoid breathing hazardous vapors, keep upwind.

TOXICITY

IRRITATION DATA: 50 mg eye-human mild; 150 mg eye-rabbit mild.

TOXICITY DATA: 8290 mg/kg oral-rat LD50;
250 mg/kg intramuscular-rat LD50

MONOHYDRATE: No data available.

DIHYDRATE: >5008 mg/kg intraperitoneal-mouse LD50.
CARCINOGEN STATUS: None

ACUTE TOXICITY LEVEL: Slightly toxic by ingestion.

TARGET EFFECTS: Poisoning may affect the calcium metabolism.

HEALTH EFFECTS AND FIRST AID

INHALATION:

ACUTE EXPOSURE: Inhalation of dust may cause irritation.

CHRONIC EXPOSURE: No data available.

FIRST AID: Remove from exposure area to fresh air immediately.
If breathing has stopped, perform artificial respiration. Keep
person warm and at rest. Treat symptomatically and supportively.
Get medical attention immediately.

SKIN CONTACT:

ACUTE EXPOSURE: May cause irritation.

CHRONIC EXPOSURE: Repeated and prolonged contact may cause dermatitis.

FIRST AID: Removed contaminated clothing and shoes immediately.
Wash affected area with soap or mild detergent and large amounts
of water until no evidence of chemical remains (approximately 15-20
minutes). Get medical attention immediately.

EYE CONTACT:

ACUTE EXPOSURE: May cause transient irritation. Tested on rabbit
eyes by continuous exposure for three hours at 0.1 M solution at
pH 7.0 to 7.5 made up to 0.46 osmolar with sodium chloride or
sucrose, caused no disturbance of the cornea.

CHRONIC EXPOSURE: No data available.

FIRST AID: Wash eyes immediately with large amounts of water or
normal saline, occasionally lifting upper and lower lids, until
no evidence of chemical remains (approximately 15-20 minutes).
Get medical attention immediately.

INGESTION:

ACUTE EXPOSURE: Ingestion may result in abdominal pain, nausea,
vomiting, diarrhea, cramps, pain and burning in the mouth. Doses
of 250 gm/kg given orally to guinea pigs, rats and rabbits produced
diarrhea. Generally, phosphates are slowly and incompletely absorbed,

therefore systemic reactions are unlikely when these salts are given orally. Sodium phosphates are capable of seriously reducing the ionic serum calcium.

CHRONIC EXPOSURE: Sodium phosphate, monobasic is used as a food additive. No adverse effects have been reported.

FIRST AID: Treat symptomatically and supportively. Get medical attention immediately. If vomiting occurs, keep head lower than hips to prevent aspiration.

ANTIDOTE:

The following antidote has been recommended. However, the decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel.

PHOSPHATES:

For hypocalcemia, after phosphate ingestion, give calcium gluconate, 5 ml of 10% solution slowly intravenously, to restore ionic calcium to normal level (Dreisbach, Handbook of Poisoning, 12th Ed.). Antidote should be administered by qualified medical personnel.

REACTIVITY

REACTIVITY: Stable under normal temperatures and pressures.

INCOMPATIBILITIES:

BRASS: May be corrosive in the presence of moisture.

METALS: Solutions may be corrosive.

STEEL: May be corrosive in the presence of moisture.

DECOMPOSITION: Thermal decomposition products may include toxic and hazardous sodium oxide and oxides of phosphorus.

POLYMERIZATION: Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

STORAGE AND DISPOSAL

Observe all Federal, State and local regulations when storing or disposing of this substance. For assistance, contact the district director of the Environmental Protection Agency.

Store away from incompatible substances.

CONDITIONS TO AVOID

May burn but does not ignite readily. Avoid contact with strong

oxidizers, excessive heat, sparks, or open flame.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:

Stop leak if you can do it without risk. For small spills, take up with sand or other absorbent material and place into clean, dry containers for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry.

PROTECTIVE EQUIPMENT

VENTILATION: Provide local exhaust or process enclosure ventilation system.

RESPIRATOR:

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection. The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Dust and mist respirator with a full facepiece. Air-purifying full facepiece respirator with a high-efficiency particulate filter.

Powered air-purifying respirator with a tight-fitting facepiece and high-efficiency particulate filter.

Type 'C'-supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in continuous-flow mode.

Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode.

Supplied-air respirator with full facepiece and operated in pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.

CLOTHING: Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged

skin contact with this substance.

GLOVES: Employee must wear appropriate protective gloves to prevent contact with this substance.

EYE PROTECTION:Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

EMERGENCY EYE WASH:

Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

Material Safety Data Sheet

Sodium tripolyphosphate

ACC# 21730

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium tripolyphosphate

Catalog Numbers: AC393960000, AC393960250, AC393961000, AC393965000, S645-500

Synonyms: Sodium triphosphate; STPP.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7758-29-4	Sodium tripolyphosphate	98-100	231-838-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Causes eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium tripolyphosphate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium tripolyphosphate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 9.12 (1% aq.sol.)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: 622 deg C (decom)

Decomposition Temperature: Not available.

Solubility: 145 g/l (20°C)

Specific Gravity/Density: >1.5

Molecular Formula: Na₅P₃O₁₀

Molecular Weight: 367.85

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of phosphorus, carbon dioxide, sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7758-29-4: YK4570000

LD50/LC50:

CAS# 7758-29-4:

Draize test, rabbit, skin: 500 mg/24H Moderate;

Oral, mouse: LD50 = 3100 mg/kg;

Oral, rat: LD50 = 3120 mg/kg;

Skin, rabbit: LD50 = >4640 mg/kg;

Carcinogenicity:

CAS# 7758-29-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-29-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7758-29-4: 5000 lb final RQ (listed under Sodium phosphate, tribasic); 2270 kg final RQ (li

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7758-29-4: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7758-29-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7758-29-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7758-29-4: 1

Canada - DSL/NDSL

CAS# 7758-29-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

EM SCIENCE DIV EM INDUSTRIES -- SODIUM STEARATE, SX0970 -- 6850-00N018318

=====
===== Product Identification =====

Product ID:SODIUM STEARATE, SX0970
MSDS Date:02/16/1988
FSC:6850
NIIN:00N018318
MSDS Number: BLWQB
=== Responsible Party ===
Company Name:EM SCIENCE DIV EM INDUSTRIES
Address:480 DEMOCRAT RD
Box:70
City:GIBBSTOWN
State:NJ
ZIP:08027
Country:US
Info Phone Num:609-354-9200
Emergency Phone Num:800-424-9300 (CHEMTREC)
CAGE:EO657

==== Contractor Identification ===

Company Name:E M SCIENCE DIV OF E M INDUSTRIES INC
Address:480 DEMOCRAT ROAD
Box:70
City:GIBBSTOWN
State:NJ
ZIP:08027
Country:US
Phone:800-222-0342/609-423-6300
CAGE:63612
Company Name:EM SCIENCE DIV EM INDUSTRIES INC
Address:111 WOODCREST RD
City:CHERRY HILL
State:NJ
ZIP:08034-0395
Phone:(609) 354-9200 OR (513) 631-0445
CAGE:EO657

=====
===== Composition/Information on Ingredients =====

Ingred Name:STEARIC ACID, SODIUM SALT
CAS:822-16-2
RTECS #:WI4725000
ACGIH TLV:10 MG/M3

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:NONE SPECIFIED BY MANUFACTURER.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:DUST MAY BE IRRITATING TO EYES OR RESPIRATORY
PASSAGES.
Medical Cond Aggravated by Exposure:RESPIRATORY CONDITIONS.

=====
===== First Aid Measures =====

First Aid:GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE. SKIN:
WASH THOROUGHLY W/SOAP & WATER. EYES: IMMEDIATELY FLUSH THOROUGHLY
W/WATER FOR A MINIMUM OF 15 MIN. INHAL: REMOVE TO FRESH AIR; GIVE
ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. INGEST: IF
CONSCIOUS, INDUCE VOMITING.

===== Fire Fighting Measures =====

Flash Point:350F,177C
Extinguishing Media:CO2, DRY CHEMICAL, WATER SPRAY.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:EXPLOSIONS CAN OCCUR WITH HEAVY DUST
CONCENTRATION IN PRESENCE OF IGNITION SOURCE.

===== Accidental Release Measures =====

Spill Release Procedures:TAKE UP & CONTAINERIZE FOR PROPER DISPOSAL.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER CLOSED. STORE IN A
COOL, DRY AREA AWAY FROM IGNITION SOURCES & OXIDIZERS.
Other Precautions:DO NOT BREATHE DUST. DO NOT GET IN EYES. AVOID
PROLONGED/REPEATED SKIN CONTACT. DO NOT TAKE INTERNALLY.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN .
Ventilation:MATERIAL SHOULD BE HANDLED OR TRANSFERED IN AN APPROVED
FUME HOOD OR W/ADEQUATE VENTILATION.
Protective Gloves:NEOPRENE GLOVES OR EQUIVALENT.
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:EYE WASH & SAFETY EQUIPMENT SHOULD BE
READILY AVAILABLE.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:N1
Melt/Freeze Pt:M.P/F.P Text:401F,205C
Spec Gravity:1.02
Solubility in Water:SLIGHT.
Appearance and Odor:WHITE POWDER; SLIGHT PARAFFINIC ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS.
Stability Condition to Avoid:DUSTING; CONTACT WITH IGNITION SOURCES.
Hazardous Decomposition Products:COX, NA2O.

===== Disposal Considerations =====

Waste Disposal Methods: TO BE PERFORMED IN COMPLIANCE WITH ALL CURRENT
LOCAL, STATE, AND FEDERAL REGULATIONS.

Disclaimer (provided with this information by the compiling agencies):
This information is formulated for use by elements of the Department
of Defense. The United States of America in no manner whatsoever,
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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Sodium sulfate anhydrous

ACC# 21630

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium sulfate anhydrous

Catalog Numbers: AC196640000, AC196640010, AC196640025, AC196640050, AC196640250, AC196640251, AC218750000, AC218750250, AC219260000, AC219260010, AC219260025, AC325600000, AC354250000, AC424410000, AC424410030, AC424410050, 21875-5000, 35425-0010, 42441-0010, BP354-500, NC9084721, NC9130094, NC9146518, NC9260017, NC9327716, NC9369056, S415-1, S415-10, S415-10S, S415-200LB, S415-212, S415-500, S415500LC, S415J500, S420-10, S420-3, S421-1, S421-10, S421-3, S421-300LB, S421-50, S421-500, S42110LC, S42150LC, S429-12, S429-212, S429-250LB, S429-500, S43112, S434-12, S78859-4

Synonyms: Bisodium sulfate; Dibasic sodium sulfate; Disodium monosulfate; Disodium sulfate; Sodium sulphate; Sulfuric acid, disodium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7757-82-6	Sodium sulfate	99	231-820-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation. Causes redness and pain.

Skin: May cause skin irritation. May cause an allergic reaction in certain individuals.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container.

Clean up spills immediately, observing precautions in the Protective Equipment section.

Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing.

Storage: Store in a cool, dry place. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: 5-8 (5% solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1700 deg C

Freezing/Melting Point:880 - 888 deg C
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:2.68 g/cm³
Molecular Formula:Na₂SO₄
Molecular Weight:142.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Dust generation, moisture, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, aluminum, magnesium.
Hazardous Decomposition Products: Oxides of sulfur, sodium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7757-82-6: WE1650000
LD50/LC50:
CAS# 7757-82-6:
Oral, mouse: LD50 = 5989 mg/kg;

Carcinogenicity:
CAS# 7757-82-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.
Teratogenicity: Oral, mouse: TDLo = 14 gm/kg (female 8-12 day(s) after conception) Effects on Newborn - other neonatal measures or effects.; Parenteral, mouse: TDLo = 60 mg/kg (female 8 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) and Specific Developmental Abnormalities - musculoskeletal system.
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 12,750 ppm; 96 Hr; Static bioassay Water flea Daphnia: LC50 = 4547 mg/L; 96 Hr; Unspecified Fish: Fathead Minnow: LC50 = 13,500-14,000 mg/L; 24 - 96 Hr; Unspecified Fish: Mosquito Fish: LC50 = 17,500 mg/L; 96 Hr; Unspecified This chemical is not expected to cause oxygen depletion in aquatic systems. It has a low potential to affect aquatic organisms and is expected to have a low potential to affect secondary waste treatment microorganisms.

Environmental: Sodium sulfate may persist indefinitely in the environment, but is not likely to show bioaccumulation or food chain contamination effects. If diluted with water, this chemical released directly or indirectly into the environment is not expected to have a significant impact.

Physical: No information available.

Other: This chemical is not likely to bioconcentrate.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7757-82-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7757-82-6 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7757-82-6: 0

Canada - DSL/NDSL

CAS# 7757-82-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sodium sulfite, anhydrous

ACC# 21660

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium sulfite, anhydrous

Catalog Numbers: AC196630000, AC196630010, AC196630025, AC219270000, AC219270010, AC219270250, AC424430000, AC424430030, AC424432500, 42443-0010, BP355-500, S430-10, S430-3, S430-500, S447-3, S447-500

Synonyms: Sulfurous acid, disodium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7757-83-7	Sodium sulfite, anhydrous	97+	231-821-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine crystals.

Warning! Contact with acids liberates toxic gas. May cause eye, skin, and respiratory tract irritation.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep from contact with oxidizing materials. Keep away from strong acids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium sulfite, anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Sodium sulfite, anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white to light yellow - fine

Odor: odorless

pH: 8.5 - 10 (5% aq. sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: >500 deg C (decom)

Decomposition Temperature: Not available.

Solubility: 23 g/100 mL (20° C)
Specific Gravity/Density: 2.63
Molecular Formula: Na₂O₃S
Molecular Weight: 126.04

Section 10 - Stability and Reactivity

Chemical Stability: Contact with acid liberates gas. Air sensitive. Moisture sensitive.
Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, acids, sodium nitrate, sodium nitrite, sulfur dioxide.
Hazardous Decomposition Products: Oxides of sulfur, hydrogen sulfide, sodium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7757-83-7: WE2150000
LD50/LC50:
CAS# 7757-83-7:
Oral, mouse: LD50 = 820 mg/kg;
Oral, rat: LD50 = 3560 mg/kg;

Carcinogenicity:
CAS# 7757-83-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information available.
Physical: No information available.
Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7757-83-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7757-83-7: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7757-83-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

R 31 Contact with acids liberates toxic gas.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7757-83-7: 1

Canada - DSL/NDSL

CAS# 7757-83-7 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

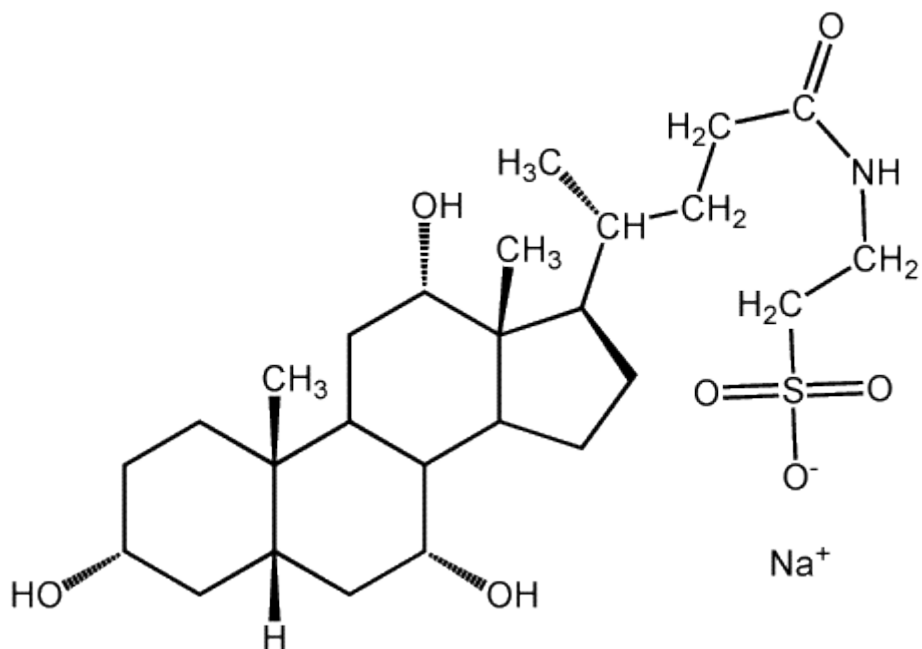
Canadian Ingredient Disclosure List

Sodium taurocholate

- Monosodium taurocholate
- Taurocholic acid sodium salt
- Cholane, ethanesulfonic acid deriv.
- Ethanesulfonic acid, 2-[[[(3a,5b,7a,12a)-3,7,12-trihydroxy-24-oxocholan-24-yl]amino]-], monosodium salt

Formula $C_{26}H_{44}NNaO_7S \cdot xH_2O$

Structure



Description White powder.

Uses Component of bile.

Registry Numbers and Inventories.

CAS 145-42-6

NIH PubChem CID 23671686

EC (EINECS/ELINCS) 205-653-7

RTECS WX0400000

RTECS class	Mutagen
Beilstein/Gmelin	3901620
Beilstein Reference	4-10-00-02078
Canada DSL/NDSL	NDSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Philippiens PICCS	Listed

Properties.

Formula	C ₂₆ H ₄₄ NNaO ₇ S
Formula mass	537.69
Melting point, °C	235

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Dark room. Refrigerator (approx 4 C). Store protected from moisture.
Handling	Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Small spills/leaks

Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.

Stability

Stable under normal temperatures and pressures.

Incompatibilities

Moisture, strong oxidizing agents.

Decomposition

Nitrogen oxides, carbon monoxide, oxides of sulfur, irritating and toxic fumes and gases, carbon dioxide, nitrogen.

Fire.

Fire fighting

Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

NFPA

Health 1

Flammability 0

Reactivity 0

Health.

Exposure effects

Ingestion

May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Skin May cause skin irritation.

Eyes May cause eye irritation.

First aid

Ingestion Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

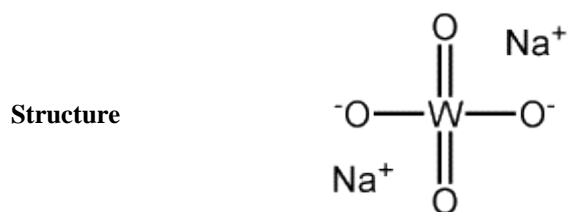
Skin Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Sodium tungstate

- Disodium wolframate
- Disodium dioxido-dioxotungsten

Formula Na_2WO_4



Description Odorless, white crystalline powder.

Uses Fireproofing and waterproofing fabrics, preparing complex compd, such as phosphotungstate, silicotungstate, as a reagent for biological products, precipitant for alkaloids.

Registry Numbers and Inventories.

CAS	13472-45-2
NIH PubChem CID	26052
EC (EINECS/ELINCS)	236-743-4
RTECS	YO7875000
RTECS class	Mutagen; Reproductive Effector
Merck	12,8847
Beilstein/Gmelin	15163 (G)
Swiss Giftliste 1	G-8924
Canada DSL/NDSL	DSL
US TSCA	Listed
Austrailia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula $\text{Na}_2\text{O}_4\text{W}$

Formula mass 293.83

Melting point, °C 698

Vapor pressure, mm _{Hg}	0.0001 (1200 C)
Density	4.179 g/cm ³ (20 C)
Solubility in water	42 g/L (21 C)

Hazards and Protection.

Storage	Store at 4 C. Keep container tightly closed.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Rubber gloves and safety goggles.
Respirators	Use NIOSH/MSHA approved respirator if needed.
Small spills/leaks	Evacuate area and ventilate. Wear protective equipment. If required, use an inert absorbent. Sweep up and place in an appropriate container for disposal. Wash contaminated surfaces.
Stability	Stable at normal temperatures.

Fire.

Fire fighting	Use water spray to disperse vapor. Use water, carbon dioxide, foam, dry chemical to extinguish fire. Wear full protective clothing and NIOSH approved self-contained breathing apparatus with full facepiece, operated in positive pressure mode.
----------------------	---

Health.

Poison_Class 4

Exposure effects

Ingestion	Causes irritation.
Inhalation	Causes irritation.
Skin	Causes irritation.
Eyes	Causes irritation.

First aid

Ingestion	The possible benefit of early removal of some ingested material by cautious gastric lavage must be weighed against potential complications of bleeding or perforation. Activated charcoal binds most toxic agents and can decrease their systemic absorption if administered soon after ingestion. Activated charcoal: administer charcoal as a slurry (240 ml water/30 g charcoal). Usual dose: 25 to 100 g in adults/adolescents.
Inhalation	Move patient to fresh air. Monitor for respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer oxygen and assist ventilation as required. Treat bronchospasm with beta ₂

agonist and corticosteroid aerosols.

Skin

Flush with water for at least 15 minutes.

Eyes

Irrigate exposed eyes with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

CHEM SERVICE INC -- STANNOUS CHLORIDE, I-156 -- 6810-00N067548

=====
Product Identification
=====

Product ID:STANNOUS CHLORIDE, I-156

MSDS Date:09/01/1988

FSC:6810

NIIN:00N067548

MSDS Number: CBGCB

=== Responsible Party ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Info Phone Num:215-692-3026

Emergency Phone Num:215-692-3026

CAGE:84898

=== Contractor Identification ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Phone:215-692-3026

CAGE:84898

Company Name:CHEM SERVICE, INC

Address:660 TOWER LN

Box:599

City:WEST CHESTER

State:PA

ZIP:19301-9650

Country:US

Phone:610-692-3026

CAGE:8Y898

=====
Composition/Information on Ingredients
=====

Ingred Name:TIN (II) CHLORIDE DIHYDRATE (1:2:2); (STANNOUS CHLORIDE)

CAS:10025-69-1

RTECS #:XP8850000

OSHA PEL:2 MG/M3 (MFR)

ACGIH TLV:2 MG/M3 (MFR)

Ingred Name:FIRST AID PROC: STOPPED ADMIN ARTF RESP. IF EXHIBITING
SIGNS OF SHOCK-KEEP WARM & QUIET. GET MED ATTN IF NEC. (ING 3)

RTECS #:9999999ZZ

Ingred Name:ING 2: IF IN CARD ARREST ADMIN CPR. CONTINUE LIFE
SUPPORTING MEASURES UNTIL MED ASSISTANCE HAS ARRIVED. REMOVE & (ING
4)

RTECS #:9999999ZZ

Ingred Name:ING 3: WASH CONTAMD CLTHG. DO NOT WEAR SHOES/CLTHG UNTIL
ABSOLUTELY FREE OF ALL CHEM ODORS. DO NOT ADMIN LIQS (ING 5)

RTECS #:9999999ZZ

Ingred Name:ING 4: OR INDUCE VOMIT TO UNCON OR CONVULSING PERSON. IF
SWALLOWED DRINK 1 TO 2 GLASSES OF WATER. CNTCT POIS CTL (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5: CTR IMMED IF NEC. IF VOMITING-WATCH CLOSELY TO MAKE
SURE AIRWAY DOES NOT BECOME OBSTRUCTED BY VOMIT.
RTECS #:9999999ZZ

Ingred Name:EYE PROT: & FULL LENGTH FACESHIELD .
RTECS #:9999999ZZ

=====
===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ALL CHEMICALS SHOULD BE CONSIDERED
HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT! CAN CAUSE EYE
IRRITATION. CAN CAUSE SKIN IRRITATION. REPEATED EXPOSURE TO VAPORS
AND/OR DUST CAN CAUSE EYE INJURY. CAN BE HARMFUL IF INHALED. DUST
AND/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CAN BE
HARMFUL IF (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ: SWALLOWED. CAN CAUSE GASTROINTESTINAL
DISTURBANCES. CAN BE IRRITATING TO MUCOUS MEMBRANES.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFT OF POISON.
IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE CAN BE
OBTAINED FROM POIS CTL CTR. EYES: FLUSH CONTINUOUSLY W/WATER FOR AT
LEAST 15-20 MIN. SKIN: FLUSH SKIN W/WATER FOR 15-20 MIN. IF NO
BURNS HAVE OCCURRED-USE SOAP & WATER TO CLEANSE SKIN. INHAL: REMOVE
TO FRESH AIR. ADMIN OXYGEN IF HAVING DFCLTY BRTHG. IF BRTHG HAS
(ING 2)

=====
===== Fire Fighting Measures =====

Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL POWDER OR WATER SPRAY.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NONE SPECIFIED BY MANUFACTURER.

=====
===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR APPROPRIATE OSHA-REGULATED
EQUIPMENT. VENTILATE AREA. SWEEP UP AND PLACE IN AN APPROPRIATE
CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE
ANY RESIDUES.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:AVOID CONTACT WITH SKIN, EYES AND

CLOTHING. KEEP TIGHTLY CLOSED AND STORE IN A COOL, DRY PLACE. STORE ONLY WITH COMPATIBLE CHEMICALS.

Other Precautions: PERSONS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD NOT HANDLE THIS CHEM OR ITS CNTNR. PROD IS FURNISHED FOR LAB USE ONLY! PRODS MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL PRODS, FOOD ADDITIVES OR AS HOUSEHOLD CHEMS.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves: IMPERVIOUS GLOVES .

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (ING 7)

Other Protective Equipment: ANSI APPROVED EYE WASH & DELUGE SHOWER . USE APPROPRIATE OSHA MSHA APPROVED SAFETY EQUIPMENT.

Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE LABORATORY.

Supplemental Safety and Health

CNDTNS TO AVOID: DECOMPOSES UNDER ALKALINE CNDTNS. DECOMPOSED BY CHLORINE GAS. AIR SENSITIVE. MATL TO AVOID: ANHYDRIDES. REACTS W/PHOSPHORUS HALIDES. INCOMPAT W/STRONG OXIDIZING AGENTS. REACTS W/THION YL CHLORIDE. REACTS W/CARBONATES.

=====
===== Physical/Chemical Properties =====

Melt/Freeze Pt: M.P/F.P Text: >99F, >37C

Spec Gravity: 2.71

Solubility in Water: DECOMPOSED BY WATER.

Appearance and Odor: WHITE CRYSTALLINE SOLID.

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES

EASILY OXIDIZED-MAY BE PEROXIDE FORMER-CHECK FOR PEROXIDES ON ALL OPENED SAMPLES. REACTS W/ACID HALIDES & (SUPDAT)

Stability Condition to Avoid: DO NOT USE MAGNESIUM/ALUMINUM OR THEIR ALLOYS AS CNTNRS. CORRODES STEEL. CORRODES COPPER & ITS ALLOYS. (SUPDAT)

Hazardous Decomposition Products: DECOMPOSITION LIBERATES TOXIC FUMES. DECOMPOSITION PRODUCTS ARE CORROSIVE.

=====
===== Disposal Considerations =====

Waste Disposal Methods: DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS . FLUSH TO SEWER WITH COPIOUS AMOUNTS OF WATER.

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GREENFIELD INDUSTRIES INC -- HIGH SPEED STEEL CUTTING TOOLS -- 5180-00F030425

=====
Product Identification
=====

Product ID:HIGH SPEED STEEL CUTTING TOOLS
MSDS Date:09/01/1988
FSC:5180
NIIN:00F030425
MSDS Number: BSLCB
=== Responsible Party ===
Company Name:GREENFIELD INDUSTRIES INC
Box:2587
City:AUGUSTA
State:GA
ZIP:30913-6899
Country:US
Info Phone Num:404-863-7708
Emergency Phone Num:404-863-7708
CAGE:GO259

==== Contractor Identification ====

Company Name:GREENFIELD INDUSTRIES INC
Box:2587
City:AUGUSTA
State:GA
ZIP:30913-6899
Country:US
Phone:404-863-7708
CAGE:GO259

=====
Composition/Information on Ingredients
=====

Ingred Name:RED IRON OXIDE/IRON (III) OXIDE/FERRIC OXIDE/YELLOW FERRIC OXIDE/METAL OXIDE/YELLOW IRON OXIDE/IRON OXIDE PIGMENT/IRON
CAS:1309-37-1
RTECS #:NO7400000
Fraction by Wt: 55-88%
OSHA PEL:10 MG/CUM
ACGIH TLV:5 MG/CUM (FE)

Ingred Name:CHROMIUM METAL, CHROMIUM, CHROME (SUSPECTED A1 HUMAN CARCINOGEN BY IARC, NTP & ACGIH)
CAS:7440-47-3
RTECS #:GB4200000
Fraction by Wt: 3.75-4%
ACGIH TLV:0.5 MG/CUM
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

Ingred Name:COBALT
CAS:7440-48-4
RTECS #:GF8750000
Fraction by Wt: 5-8%
Other REC Limits:0.05 PPM
OSHA PEL:0.1 MG/CUM
ACGIH TLV:0.05 MG/CUM

Ingred Name:MOLYBDENUM (SOLUBLE COMPOUND), LEAD MOLYBDATE
CAS:7439-98-7
RTECS #:QA4680000
Fraction by Wt: 0.5-9.5%
OSHA PEL:5 MG/CUM
ACGIH TLV:5 MG/CUM

Ingred Name:TUNGSTEN (INSOLUBLE), WOLFRAM
CAS:7440-33-7
RTECS #:YO7175000
Fraction by Wt: 1.5-18%
ACGIH TLV:5 MG/CUM

Ingred Name:VANADIUM
CAS:1314-62-1
RTECS #:YW1355000
Fraction by Wt: 1-5%
OSHA PEL:0.5 MG/CUM
ACGIH TLV:0.05 MG/CUM (DUST)
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

=====
===== Hazards Identification =====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO
Health Hazards Acute and Chronic:PRIMARY IRRITANT & LUNG DISEASE
INHIBITOR. COBALT: DUST CAN CAUSE NOSE/THROAT IRRITATION,
SENSITIZATION & ALLERGIC DERMATITIS. VANADIUM: DUST IRRITATES
EYES/NOSE/THROAT/RESPIRATORY TRACT, CAN CAUSE AL LERGIC REACTION,
BRONCHITIS.
Explanation of Carcinogenicity:SEE INGREDIENTS
Effects of Overexposure:VANADIUM: GREEN DISCOLORATION OF TONGUE,
WHEEZING, & CHEST PAIN.

=====
===== First Aid Measures =====

First Aid:INHALATION: REMOVE TO FRESH AIR. OBTAIN MEDICAL ATTENTION IN
ALL CASES.

=====
===== Fire Fighting Measures =====

Flash Point:NONE

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:IF FUME/DUST CONDITIONS EXCEED TLV'S, USE NIOSH
APPROVED RESPIRATOR W/FILTER FOR DUSTS & FUMES.
Ventilation:WHEN GRINDING/POLISHING/ABRADING, USE LOCAL EXHAUST. USE
ADEQUATE TO CONTROL ANY RELEASES.
Protective Gloves:AS REQUIRED
Eye Protection:INDUSTRIAL GRADE SAFETY GLASSES
Other Protective Equipment:AS REQUIRED
Supplemental Safety and Health
CUTTING TOOLS MADE FROM HIGH SPEED STEEL ARE NOT CONSIDERED
PHYSICAL/HEALTH HAZARDS IN THE FORM THEY ARE SOLD. ANY
GRINDING/POLISHING/MELTING/ABRADING MAY RELEASE

DUST/MIST/FUMES/CHIPS WHICH MAY PRESENT A HEALTH HAZARD. THE POSSIBLE HAZARDS OF THIS ACTIVITY DEPENDS ON THE MATERIAL BEING MODIFIED/CUTTING FLUIDS APPLIED.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:>5000F
Melt/Freeze Pt:M.P/F.P Text: 2500F
Spec Gravity: 7.8-8.2
Solubility in Water:INSOLUBLE
Appearance and Odor:VARIOUS SOLID SHAPES; W/NO ODOR

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG ACIDS
Hazardous Decomposition Products:HYDROGEN GAS & METALLIC OXIDES

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE IN ACCORDANCE W/LOCAL, STATE, & FEDERAL REGULATIONS.

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Strontium bromide

- Strontium dibromide

Formula SrBr₂



Description Dark brown liquid.

Uses Used in flares and also has some pharmaceutical uses.

Registry Numbers and Inventories.

CAS	10476-81-0
NIH PubChem CID	25302
EC (EINECS/ELINCS)	233-969-5
EC Class	R: 36/37/38, S: 26-36
RTECS	WK8050000
RTECS class	Other
Merck	13,8917
Beilstein/Gmelin	9277 (G)
Swiss Giftliste 1	G-2889
Canada DSL/NDSL	NDSL
US TSCA	Listed
Australia AICS	Listed

Korea ECL

Listed

Properties.

Formula	Br ₂ Sr
Formula mass	247.43
Melting point, °C	643
Boiling point, °C	2146
Density	4.175 g/cm ³ (25 C)
Refractive index	1.575
Dielectric constant	3.36
Heat of fusion	21.8 kJ/mol

Hazards and Protection.

Storage	Keep tightly closed. Store in a cool dry place. Handle and store under argon.
Protection	Compatible chemical-resistant gloves. Chemical safety goggles.
Respirators	Government approved respirator.
Small spills/leaks	Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.
Stability	Stable at normal temperatures and pressures. Protect from moisture.
Incompatibilities	Strong oxidizing agents.
Decomposition	Strontium oxides, Hydrogen bromide gas.

Fire.

Fire fighting Extinguish using water spray, carbon dioxide, dry chemical powder, or appropriate foam. Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Hazards Emits toxic fumes under fire conditions.

NFPA **Health** 2

Flammability 0

Reactivity 1

Health.

Poison_Class 3

Exposure effects Irritant. Irritating to eyes, respiratory system and skin.

Ingestion May be harmful if swallowed.

Inhalation Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Skin Causes skin irritation. May be harmful if absorbed through the skin.

Eyes Causes eye irritation.

First aid

Ingestion If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Skin In case of contact, immediately wash skin with soap and copious amounts of water.

Eyes In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Strontium chloride

Formula	SrCl
Structure	$\text{Cl}^- \quad \text{Sr}^{2+} \quad \text{Cl}^-$
Description	White to colorless crystals.
Uses	Production of other strontium salts.

Registry Numbers and Inventories.

CAS	10476-85-4
NIH PubChem CID	5362485
EC (EINECS/ELINCS)	233-971-6
RTECS	WK8400000
RTECS class	Mutagen
Merck	12,9000
Beilstein/Gmelin	37839 (G)
Swiss Giftliste 1	G-2025
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed

Korea ECL Listed

Philippiens PICCS Listed

Properties.

Formula	Cl ₂ Sr
Formula mass	118.18
Melting point, °C	868
Boiling point, °C	1250
Density	1.96 g/cm ³ (20 C)
Solubility in water	Soluble

Hazards and Protection.

Storage Keep well closed.

Handling All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.

Protection Intense heat may necessitate use of self-contained breathing apparatus.

Respirators Use NIOSH/MSHA approved respirator appropriate for exposure of concern.

Small spills/leaks Evacuate area and ventilate. Wear protective equipment. If required, use an inert absorbent. Sweep up and place in an appropriate container for disposal. Wash contaminated surfaces.

Stability Stable.

Incompatibilities Strong oxidizing agents.

Fire.

Fire fighting Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use agent most appropriate to extinguish fire.

Fire potential Nonflammable.

NFPA

Health	1
Flammability	0
Reactivity	0

Health.

Poison_Class 3

Exposure effects The toxicological properties of this material have not been investigated.

First aid

Ingestion Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

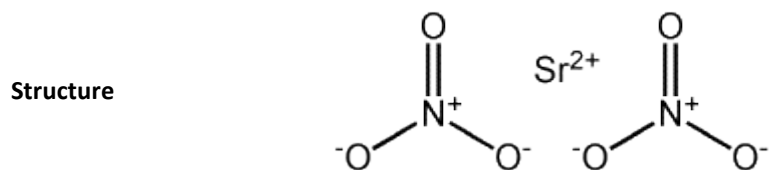
Skin Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Eyes If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Strontium nitrate

- Strontium dinitrate

Formula $\text{Sr}(\text{NO}_3)_2$



Description A white crystalline solid.

Uses In signal lights, marine signals, railroad flares, matches, in pyrotechnics (red fire).

Registry Numbers and Inventories.

CAS 10042-76-9

NIH PubChem CID 24848

EC (EINECS/ELINCS) 233-131-9

EC Class O, R: 8

RTECS WK9800000

RTECS class Other

UN (DOT) 1507

Merck 12,9007

Beilstein/Gmelin 80039 (G)

Swiss Giftliste 1 G-2892

Canada DSL/NDSL DSL

US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	N2O6Sr
Formula mass	211.63
Melting point, °C	570
Boiling point, °C	645
Vapor density (air=1)	7.3
Odor threshold	Odorless
Density	2.113 g/cm ³
Solubility in water	710 g/L

Hazards and Protection.

Storage	Do not store near combustible materials. Store in a cool, dry place. Store in a tightly closed container.
Handling	Minimize dust generation and accumulation. Avoid breathing dust, vapor, mist, or gas. Avoid contact with skin and eyes. Use only in a chemical fume hood.

Protection	Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	A NIOSH/MSHA approved air purifying dust or mist respirator or European Standard EN 149.
Small spills/leaks	Carefully scoop up and place into appropriate disposal container.
Disposal code	14
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong acids, combustible and flammable materials (e.g. alkyl resins, asphalt, gasoline, grease, methyl acetone, polystyrene, polyurethane), reducing agents, active metals, phosphorus, sulfur.
Decomposition	Nitrogen oxides.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with combustible materials may cause a fire. Substance is noncombustible. Extinguishing media: Use water spray to cool fire-exposed containers. Use water only!
Fire potential	Nonflammable.
Hazards	May explode from heat or contamination. May react explosively with hydrocarbons (fuels). May ignite combustibles.
Combustion products	Yields toxic gaseous oxides of nitrogen when involved in fire.

NFPA	Health	1
	Flammability	0
	Reactivity	0
	Special	0

Health.

Exposure limit(s) OSHA PEL: 15 mg/m³ total dust, 5 mg/m³ respirable fraction for nuisance dusts.

Poison_Class 3

Exposure effects Orthostatic abnormally low blood pressure and rapid heart rate are common. Abnormally low blood pressure and low heart rate are possible. Throbbing headache is common. Seizures have been reported following severe intoxication. Behavioral deficits were observed in the adult offspring of rats who received sodium nitrite prenatally.

Ingestion Expected to be a low ingestion hazard.

Inhalation May cause respiratory tract irritation.

Skin May cause skin irritation.

Eyes May cause eye irritation.

First aid

Ingestion Get medical aid. Wash mouth out with water.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Skin Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 1507



Response guide [140](#)

Hazard class 5.1

Packing Group III

USCG CHRIS Code STN

HS Code 2834 29 80

Std. Transport # 4918754

Sulfur

- Brimstone
- Flowers of sulfur

Formula S

Structure



Description Yellow powder. Exists in several forms such as s₂, s₈ and polymeric.

Uses

In manufacturing sulfuric acid, carbon disulfide, sulfites, insecticides, plastics, enamels, metal-glass cements, in vulcanizing rubber, in syntheses of dyes, in making gunpowder, matches, for bleaching wood pulp, straw, wool, silk, felt, linen.

Registry Numbers and Inventories.

CAS	7704-34-9
NIH PubChem CID	5362487
EC (EINECS/ELINCS)	231-722-6
EC Class	R: 11-36, S: 16-26-36
RTECS	WS4250000
RTECS class	Agricultural Chemical and Pesticide; Primary Irritant
UN (DOT)	1350
Merck	12,9142
Beilstein/Gmelin	16299 (G)
EPA OPP	77501

Swiss Giftliste 1	G-54929
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Philippiens PICCS	Listed
Israel	Listed

Properties.

Formula	S
Formula mass	32.06
Melting point, °C	113 - 119
Boiling point, °C	445
Vapor pressure, mm_{Hg}	0.075 (20 C)
Vapor density (air=1)	3.64
Critical temperature	1040
Density	2.36 g/cm ³
Solubility in water	Insoluble
Viscosity	11.130 cp at 120 C
Surface tension	60.8 g/s ²

Refractive index	2.068
Dipole moment	0 D
Dielectric constant	3.48 (150 C)
Thermal expansion	0.00046/K (20 C)
Heat of fusion	1.2 kJ/mol
Heat of vaporization	8.9 kJ/mol
Heat of combustion	-353 kJ/mol

Hazards and Protection.

Storage	Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
WHMIS	B4
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. May form flammable dust-air mixtures. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Use with adequate ventilation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	When Hydrogen Sulfide (H ₂ S) concentrations are unknown or are equal to or greater than 10 ppm, (as in such activities as: loading; unloading; guaging; cleaning large spills or upon entry into tanks, vessels, or other confined spaces; and during rescue of individuals suspected to be overexposed to H ₂ S), use supplied-air (airline or self-contained breathing apparatus) respiratory protection (NIOSH/MSHA Approved). The

respirators must be equipped with pressure-demand regulators and operated in the pressure demand mode ONLY. If airline units are used, a 5-minute egress bottle MUST also be carried. GAS MASKS OR OTHER AIR-PURIFYING RESPIRATORS MUST NEVER BE USED FOR H2S DUE TO POOR WARNING PROPERTIES OF THE GAS.

Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.
Stability	Stable at room temperature in closed containers under normal storage and handling conditions.
Incompatibilities	Alkalis and oxidizing agents such as chlorine and fluorine. May react explosively with ammonia, ammonium nitrate, chlorine dioxide (bromates, chlorates, and iodates of barium, calcium, magnesium, potassium, sodium or zinc), chlorate in presence of copper), chromic anhydride, silver bromate, lead dioxide, mercuric nitrate, all inorganic perchlorates, phosphorus trioxide, sodium nitrate, and zinc.
Decomposition	Sulfur oxides (SOx), including sulfur oxide and sulfur dioxide.

Fire.

Flash Point, °C	160
Autoignition, °C	235
Upper exp. limit, %	46
Lower exp. limit, %	3.3

Fire fighting	Wear full protective clothing and positive pressure breathing apparatus. Use fine spray or fog to control fire by preventing its spread and absorbing some of its heat. Use water spray to cool fire-exposed surfaces, protect personnel, and knock down toxic fumes. Water or foam may cause frothing of molten sulfur. Extinguish fire using agent suitable for surrounding fire. (Fire in liquid sulfur can be extinguished readily by closing container to exclude oxygen).
Fire potential	Flammable/combustible material.

Hazards May be ignited by friction, heat, sparks or flames. Some may burn rapidly with flare burning effect. Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence. Substance may be transported in a molten form. May re-ignite after fire is extinguished.

Combustion products Produces toxic sulfur dioxide gas.

NFPA **Health** 1

Flammability 1

Reactivity 0

Health.

Exposure limit(s) ACGIH TLV: 10 mg/m³; OSHA PEL 15 mg/m³

Poison_Class 5

Exposure effects Repeated inhalation may cause lung damage.

Ingestion May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation Vapors are irritating to the nose, throat and respiratory tract, and may cause chronic bronchitis with chronic exposure. Hydrogen sulfide may not be sensed by smell at concentrations of 150 ppm or greater. Hydrogen sulfide is life threatening above 200 ppm. Inhalation at 200 - 250 ppm produces headache, dizziness, excitement, staggering and vomiting. Prolonged exposure to hydrogen sulfide in this concentration range may cause lung damage and exposure for 4 to 8 hours can cause death. Concentrations of 300-500 ppm (of hydrogen sulfide) cause these same effects sooner and more severely. Death can occur in 1 to 4 hours. At 500 ppm respiratory failure can occur in 5 minutes to 1 hour. Exposures above 500 ppm rapidly cause unconsciousness and death.

Skin May cause irritation with discomfort, and seen as local redness and possible swelling. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort. Skin contact with hot or molten product can cause skin burns.

Eyes

May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye. Eye contact with hot or molten product can cause eye burns.

First aid

Ingestion

DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give 1/2 to 1 glass of water to dilute material. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomit, rinse mouth and administer more water. IMMEDIATELY contact local poison control center. Vomiting may need to be induced but should be directed by a physician or a poison control center. IMMEDIATELY transport victim to an emergency facility.

Inhalation

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Skin

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Eyes

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 1350

Response guide [133](#)

Hazard class 4.1



Packing Group III

USCG CHRIS Code SXY

**USCG Compatatibility
Group**

0 Unassigned

HS Code

2802 00 00

Std. Transport #

4917403

IMO Pollution Category

III

IMO Hazard code

S

FISHER SCIENTIFIC -- TALCUM, T4 500 -- 6505-00N074312

=====
Product Identification
=====

Product ID:TALCUM, T4 500
MSDS Date:03/04/1996
FSC:6505
NIIN:00N074312
MSDS Number: CCQNN
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:TALC (POWDER), CONTAINING NO ASBESTOS FIBERS; (TALC)
(CONTAINING ING 2)
CAS:14807-96-6
RTECS #:WW2710000
Fraction by Wt: 100%
OSHA PEL:20 MPPCF
ACGIH TLV:2 MG/M3 RDUST

Ingred Name:SILICA, CRYSTALLINE - QUARTZ; (CRYSTALLINE SILICA)
CAS:14808-60-7
RTECS #:VV7330000
Fraction by Wt: <1%
OSHA PEL:SEE TABLE Z-3
ACGIH TLV:0.1 MG/M3 RDUST

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO
Health Hazards Acute and Chronic:ACUTE:EYE:DUST MAY CAUSE MECHANICAL
IRRIT. SKIN:MAY CAUSE MILD IRRIT. INGEST:NO HAZARD EXPECTED IN
NORMAL INDUSTRIAL USE. INHAL:DUST IS IRRIT TO RESP TRACT.
CHRONIC:CHRONIC INHAL OF TALC CAN CAUSE TAL C PNEUMOCONIOSIS.
HOWEVER, THIS IS MUCHMORE PREVALENT IN EXPOS TO TALC CNTNG ASBESTOS
THAN THAT W/OUT. (EFTS OF OVEREXP)

Explanation of Carcinogenicity:SILICA, CRYSTALLINE-QUARTZ:IARC
MONOGRAPHS, SUPP, VOL 7, PG 341, 1987:GRP 2A. NTP 7TH ANNUAL RPT ON
CARCINS, (SUPP DATA)

Effects of Overexposure:HLTH HAZ:WHEN INJECTED BY INTRAVENOUS DRUG
USERS FOR LONG PERIODS, USUALLY SEVERAL YEARS, TALC, IN FORM OF
FILLER USED ALONG W/STARCH, CAN CAUSE SEV LUNG DMG & CHARACT
RETINOPATHY. TALC:SUSPECTED OCCU P CARCIN (MFR). EQUIVOCAL
TUMORIGEN BY RTECS CRITERIA. INHAL EXPOS CAN CAUSE TUMORS OF THE
LUNGS & THORAX IN RATS.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:EYES:IMMED FLUSH W/PLENTY OF WATER FOR AT LST 15 MINS, OCCAS
LIFTING UPPER & LOWER LIDS. IF IRRIT DEVELOPS, GET MED AID.
SKIN:GET MED AID IF IRRIT DEVELOPS/PERSISTS. FLUSH W/PLENTY OF SOAP
& WATER. IN GEST:IF VICTIM IS CONSCIOUS & ALERT, GIVE 2-4 CUPFULS
OF MILK/WATER. NEVER GIVE ANYTHING BY MOUTH TO UNCON PERS. GET MED
AID IF IRRIT/SYMP S OCCUR. INHAL:REMOVE FROM EXPOS TO FRESH AIR
IMMED. (SUPDAT)

=====
===== Fire Fighting Measures =====

Extinguishing Media:SUBSTANCE IS NONFLAMMABLE; USE AGENT MOST
APPROPRIATE TO EXTINGUISH SURROUNDING FIRE.

Fire Fighting Procedures:USE NIOSH APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT . MATERIAL WILL NOT BURN.

Unusual Fire/Explosion Hazard:NONE SPECIFIED BY MANUFACTURER.

=====
===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP, THEN PLACE INTO A SUITABLE CLEAN,
DRY CONTAINER FOR DISPOSAL. AVOID GENERATING DUSTY CNDTNS.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY PLACE. KEEP
CONTAINER CLOSED WHEN NOT IN USE. USE W/ADEQUATE VENTILATION.

Other Precautions:CAUTION! MAY CAUSE EYE AND SKIN IRRITATION. MAY CAUSE
RESPIRATORY AND DIGESTIVE TRACT IRRITATION. USE PROPER PERSONAL
PROTECTIVE EQUIPMENT AS INDICATED IN EXPOSURE CONTROLS, PERSONAL
PROTECTION SECTIO N.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:FOLLOW OSHA RESPIRATOR REGULATIONS FOUND IN 29
CFR 1910.134. ALWAYS USE A NIOSH APPROVED RESPIRATOR WHEN
NECESSARY.

Ventilation:USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP
AIRBORNE CONCENTRATIONS BELOW PELS.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .

Other Protective Equipment:EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET
ANSI DESIGN CRITERIA . WEAR APPROP PROT CLTHG TO PREVENT SKIN
EXPOS.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

EXPLAN OF CARCIN:1994:ANTIC TO BE CARCIN. FIRST AID PROC:IF NOT BRTHG,
GIVE ARTF RESP. IF BRTHG IS DFCLT, GIVE OXYG. GET MED AID IF
COUGH/OTHER SYMPS APPEAR. NOTES TO MD:TREAT SYMPTOMATICALLY &
SUPPORT TIVELY.

===== Physical/Chemical Properties =====

Spec Gravity:2.5-2.8
Solubility in Water:INSOLUBLE
Appearance and Odor:SOLID, WHITE TO OFF-WHITE POWDER; ODORLESS.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NO INCOMPATIBILITIES REPORTED.
Stability Condition to Avoid:NONE REPORTED.
Hazardous Decomposition Products:NONE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT W/FEDERAL,
STATE & LOCAL REGULATIONS. NOT LISTED AS A MATERIAL BANNED FROM
LAND DISPOSAL ACCORDING TO RCRA.

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of Defense. The United States of America in no manner whatsoever,
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assume responsibility for the suitability of this information to their
particular situation.

Titanium dioxide

- Unitane
- Rutile
- Titanium oxide
- Titanium peroxide
- Titania
- Dioxotitanium

Formula TiO_2

Structure $\text{O}=\text{Ti}=\text{O}$

Description Pure titanium dioxide is a white powder or fine, needle-like crystals. Naturally occurring crystals usually contain impurities which color them yellow, yellowish brown, reddish brown, red, brown, blue, green gray or black.

Uses Component of porcelain enamels & glazes-eg, as opacifier.

Registry Numbers and Inventories.

CAS	13463-67-7
NIH PubChem CID	26042
EC (EINECS/ELINCS)	236-675-5
EC Class	S: 22 24/25
RTECS	XR2275000
RTECS class	Tumorigen; Mutagen; Primary Irritant
UN (DOT)	2546
Merck	12,9612
Beilstein/Gmelin	9354 (G)

Swiss Giftliste 1	G-2950
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	O2Ti
Formula mass	79.90
Melting point, °C	1855
Boiling point, °C	2900
Vapor pressure, mm_{Hg}	3 (1727 C)
Density	4.2 g/cm ³
Solubility in water	Insoluble
Refractive index	2.44
Dielectric constant	180 (20 C)
Thermal expansion	8.2E-6/K

Heat of vaporization 612.3 kJ/mol

Hazards and Protection.

Storage Store in a cool, dry, well-ventilated area away from incompatible substances.

WHMIS Probably does not meet criteria

Handling Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Protection Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Small spills/leaks Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.

Stability Stable under normal temperatures and pressures.

Incompatibilities A violent or incandescent reaction with metals (aluminum, calcium, magnesium, potassium, sodium, zinc and lithium) may occur at high temperatures. Substance is incompatible with strong acids.

Decomposition Titanium/titanium oxides.

Fire.

Fire fighting Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-

combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Fire potential Noncombustible.

Hazards this chemical is noncombustible.

[NFPA](#) Health 1

Flammability 0

Reactivity 0

Health.

Exposure limit(s) OSHA PEL: TWA 15 mg/m³ NIOSH REL: Ca See Appendix A NIOSH IDLH: Potential occupational carcinogen 5000 mg/m³

Poison_Class -

Exposure effects Chronic inhalation may cause pulmonary fibrosis.

Ingestion No hazard expected in normal industrial use. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation Dust is irritating to the respiratory tract. May cause pulmonary fibrosis and permanent damage.

Skin Dust may cause mechanical irritation.

Eyes Dust may cause mechanical irritation.

First aid

Ingestion Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration.

Skin Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 2546

Response guide [135](#)

USCG CHRIS Code TDS

[USCG Compatatibility Group](#) 43 Misc. water solutions

HS Code 2823 00 00

IMO Chemical Code 18

IMO Pollution Category III

Material Safety Data Sheet

Zinc sulfate, aqueous solution

ACC# 89980

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc sulfate, aqueous solution

Catalog Numbers: 67001

Synonyms:

Company Identification:

Fisher Diagnostics
Fisher Scientific Company, LLC
8365 Valley Pike
Middletown, VA 22645-0307

For information, call: 800-524-0294

Emergency Number: 800-524-0294

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	50	231-791-2
7733-02-0	Zinc sulfate	35	231-793-3
0-00-0	Inhibitor	<1	unlisted
90-43-7	Dowicide	<1	201-993-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. **Caution!** May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact

with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Zinc sulfate	none listed	none listed	none listed
Inhibitor	none listed	none listed	none listed
Dowicide	none listed	none listed	none listed

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Zinc sulfate: No OSHA Vacated PELs are listed for this chemical. Inhibitor: No OSHA Vacated PELs are listed for this chemical. Dowicide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear, colorless

Odor: odorless

pH: 4 - 5

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 100 deg C

Decomposition Temperature: Not available.

Solubility: Soluble in water
Specific Gravity/Density: 1.18
Molecular Formula: Not applicable.
Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Excess heat.
Incompatibilities with Other Materials: None reported with materials and contaminants which the material may reasonably come into contact.
Hazardous Decomposition Products: Oxides of sulfur, toxic fumes of zinc oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 7733-02-0: ZH5260000

CAS# 0-00-0 unlisted.

CAS# 90-43-7: DV5775000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg; <BR.

CAS# 7733-02-0:

Draize test, rabbit, eye: 420 ug Moderate;

Oral, mouse: LD50 = 245 mg/kg;

Oral, rabbit: LD50 = 2 gm/kg; <BR.

CAS# 0-00-0: <BR.

CAS# 90-43-7:

Draize test, rabbit, eye: 50 ug/24H Severe;

Draize test, rabbit, skin: 250 mg;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Oral, mouse: LD50 = 1050 mg/kg;

Oral, rat: LD50 = 2 gm/kg;

Oral, rat: LD50 = 2700 mg/kg; <BR.

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7733-02-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 0-00-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 90-43-7:

California: carcinogen, initial date 8/4/00

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: No data available. No information found.

Environmental: No information reported.

Physical: No information found.

Other: No information found.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	No information available.	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 7733-02-0 is listed on the TSCA inventory.

CAS# 0-00-0 is not listed on the TSCA inventory. It is for research and development use only.

CAS# 90-43-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA**CERCLA Hazardous Substances and corresponding RQs**

CAS# 7733-02-0: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 0-00-0: acute, reactive. CAS # 90-43-7: acute.

Section 313

This material contains Zinc sulfate (listed as Zinc compounds), 35%, (CAS# 7733-02-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373. This chemical is not at a high enough concentration to be reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7733-02-0 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7733-02-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7733-02-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 0-00-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 90-43-7 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

WARNING: This product contains Dowicide, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

Risk Phrases:**Safety Phrases:**

S 22 Do not breathe dust.

S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 7733-02-0: 1

CAS# 0-00-0: No information available.

CAS# 90-43-7: 2

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 7733-02-0 is listed on Canada's DSL List.

CAS# 90-43-7 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

Canadian Ingredient Disclosure List

CAS# 7733-02-0 is listed on the Canadian Ingredient Disclosure List.

CAS# 90-43-7 is listed on the Canadian Ingredient Disclosure List.