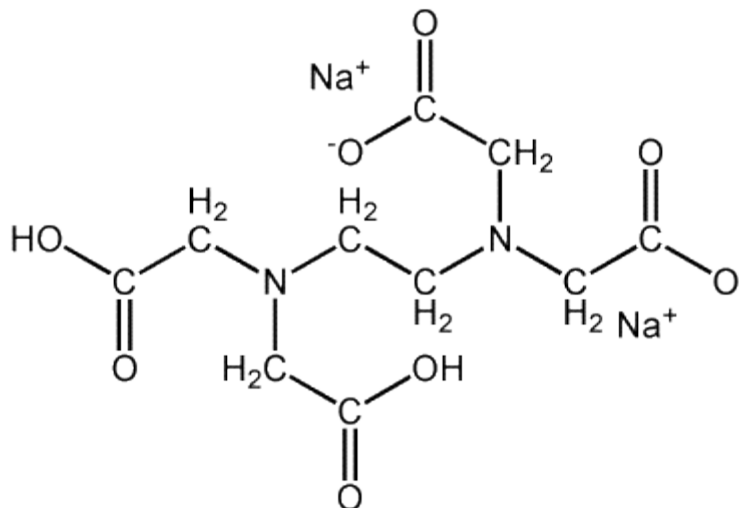


EDTA, disodium salt

- (Ethylenedinitrilo)tetraacetic acid disodium salt
- Disodium dihydrogen ethylenediaminetetraacetate
- N,N'-1,2-Ethanediybis[N-(carboxymethyl)glycine], disodium salt, dihydrate
- Disodium edetate
- Cheladrate
- Disotate

Formula $C_{10}H_{14}N_2Na_2O_8$

Structure



Description Odorless, white crystals.

Uses Sequestering agent.

Registry Numbers and Inventories.

CAS	139-33-3
NIH PubChem CID	8759
EC (EINECS/ELINCS)	205-358-3
RTECS	AH4375000
RTECS class	Mutagen; Reproductive Effector
Merck	12,3556
Beilstein/Gmelin	3822669
Beilstein Reference	4-04-00-02449
EPA OPP	39115
Swiss Giftliste 1	G-6585
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	C10H14N2Na2O8
Formula mass	336.21
Decomposition point, °C	252
Solubility in water	100 g/L

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	Safety goggles, chemical resistant gloves such as neoprene, protective clothings.
Respirators	If overexposure has been determined or documented, a NIOSH/MSHA jointly approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators under specified conditions.
Small spills/leaks	Small Spill - Sweep up material for disposal or recovery. Large Spill - Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Shovel material into containers. Thoroughly sweep area of spill to clean up any residual material. Do not flush into sewers. Material should be placed in a container for recovery or transfer to a disposal facility.
Stability	Stable.
Incompatibilities	Keep away from oxidizing agents.
Decomposition	Ammonia, carbon dioxide and carbon monoxide, nitrogen oxides.

Fire.

Fire fighting	Extinguish fire using regular foam, carbon dioxide, dry chemical. 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.
Hazards	Dust can form explosive mixtures in air.
NEPA	Health
	1

Flammability 0

Reactivity 0

Health.

Poison_Class 4

Exposure effects

Ingestion Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation Irritation.

Skin Can cause skin irritation. Symptoms may include redness and burning of skin, and other skin damage.

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.

Skin Remove contaminated clothing. Flush exposed area with large amounts of water. If skin is damaged, seek immediate medical attention. If skin is not damaged and symptoms persist, seek medical attention. Launder clothing before reuse.

Eyes If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Material Safety Data Sheet

1,1,2-Trichloroethane

ACC# 26380

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,1,2-Trichloroethane

Catalog Numbers: T339-1, T339-4

Synonyms: Vinyl trichloride; beta-Trichloroethane; Ethane trichloride; 1,2,2-Trichloroethane.

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
79-00-5	1,1,2-trichloroethane	ca. 100	201-166-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear almost colorless liquid.

Warning! Harmful if swallowed. May cause eye and skin irritation. May cause respiratory tract irritation. May be harmful if absorbed through skin or if inhaled. May cause central nervous system depression.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May be absorbed through the skin in harmful amounts. Exposure may cause irritation characterized by redness, dryness, and inflammation.

Ingestion: May cause 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 be harmful if swallowed.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Long-term vapor exposure to 1,1,2-trichloroethane causes chronic gastric symptoms, fat deposition in the kidneys, and damage to the lungs.

Chronic: May cause liver and kidney damage. Mice, but not rats, that were given high doses of 1,1,2-trichloroethane by mouth for most of their life developed liver cancer, but we do not know whether humans exposed to this chemical would develop cancer. From the limited information available in animals, it appears that 1,1,2-trichloroethane does not cause birth defects or otherwise inhibit normal development.

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: 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. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. 1,1,2-trichloroethane has no flash point in conventional closed tester; however, vapors in containers can explode if subjected to a high energy source.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: None

Autoignition Temperature: 459 deg C (858.20 deg F)

Explosion Limits, Lower: 6.0 vol %

Upper: 15.5 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: 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. Flush spill area with water. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not reuse this container. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist.
Storage: Store in a cool, dry place. Keep from contact with oxidizing materials. Do not store in metal containers. 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
1,1,2-trichloroethane	10 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	10 ppm TWA; 45 mg/m ³ TWA 100 ppm IDLH	10 ppm TWA; 45 mg/m ³ TWA

OSHA Vacated PELs: 1,1,2-trichloroethane: 10 ppm TWA; 45 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: Liquid

Appearance: clear almost colorless

Odor: sweetish odor

pH: Not available.

Vapor Pressure: 17 mm Hg @ 20 deg C

Vapor Density: 4.63 (Air=1)

Evaporation Rate:Not available.

Viscosity: 1.69 cP @ 25C

Boiling Point: 110 - 115 deg C @ 760mm Hg

Freezing/Melting Point:-37 deg C

Decomposition Temperature:Not available.

Solubility: 0.45% @ 20°C

Specific Gravity/Density:1.4350g/cm³

Molecular Formula:C₂H₃Cl₃

Molecular Weight:133.40

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, strong bases, ammonia, Active metals (such as potassium and magnesium)..

Hazardous Decomposition Products: Hydrogen chloride, phosgene, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 79-00-5: KJ3150000

LD50/LC50:

CAS# 79-00-5:

Draize test, rabbit, eye: 162 mg Mild;

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 810 mg/24H Severe;

Draize test, rabbit, skin: 500 mg/24H Mild;

Oral, mouse: LD50 = 378 mg/kg;

Oral, mouse: LD50 = 378 mg/kg;

Oral, rat: LD50 = 836 mg/kg;

Skin, rabbit: LD50 = 3730 uL/kg;

LCLo ihl rat: 500 ppm/4H. skn gpg: 970 mg/kg.

Carcinogenicity:

CAS# 79-00-5:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 10/1/90
- **NTP:** Not listed.
- **IARC:** Not listed.

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: In air, substance should degrade by reaction with hydroxyl radicals.

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:

CAS# 79-00-5: waste number U227.

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:		
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Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 79-00-5 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 79-00-5: Effective 6/1/87, Sunset 6/1/97

Chemical Test Rules

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

Section 12b

CAS# 79-00-5: Section 4

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

CAS# 79-00-5: 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 # 79-00-5: immediate, delayed.

Section 313

1,1,2-trichloroethane is not at a high enough concentration to be reportable under Section 313. No chemicals are reportable under Section 313.

Clean Air Act:

CAS# 79-00-5 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. CAS# 79-00-5 is listed as a Priority Pollutant under the Clean Water Act. CAS# 79-00-5 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# 79-00-5 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 1,1,2-trichloroethane, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 79-00-5: 10 æg/day NSRL

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 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 79-00-5: 3

Canada - DSL/NDSL

CAS# 79-00-5 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# 79-00-5 is listed on the Canadian Ingredient Disclosure List.

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:C₂₃H₂₃IN₂
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

1,10-Phenanthroline monohydrate

ACC# 60460

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,10-Phenanthroline monohydrate

Catalog Numbers: AC130130000, AC130130050, AC130130250, AC417120000, AC417120010, AC417120050, P70-10, P70-5, S76781

Synonyms: o-Phenanthroline 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
5144-89-8	1,10-Phenanthroline monohydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: off-white solid.

Warning! Toxic if swallowed. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause eye, skin, and respiratory tract irritation.

Target Organs: Kidneys.

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. Toxic if swallowed.

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

Chronic: Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic 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. 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: 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 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: 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
1,10-Phenanthroline monohydrate	none listed	none listed	none listed
1,10-phenanthroline, anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: 1,10-Phenanthroline monohydrate: No OSHA Vacated PELs are listed for this chemical. 1,10-phenanthroline, 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: off-white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 6.2

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 97 - 101 deg C

Decomposition Temperature:Not available.

Solubility: Slightly soluble.

Specific Gravity/Density:Not available.

Molecular Formula:C12H8N2.H2O

Molecular Weight:198.23

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 acids.

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

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 5144-89-8: SF8437000

CAS# 66-71-7: SF8300000

LD50/LC50:

Not available.

Not available.

For the anhydrous material: Oral LD50 (rat): 132 mg/kg.

Carcinogenicity:

CAS# 5144-89-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 66-71-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

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:	TOXIC SOLID, 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# 5144-89-8 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)).

CAS# 66-71-7 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# 5144-89-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 66-71-7 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:**

T N

Risk Phrases:

R 25 Toxic if swallowed.

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

WGK (Water Danger/Protection)

CAS# 5144-89-8: No information available.

CAS# 66-71-7: 2

Canada - DSL/NDSL

CAS# 66-71-7 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

1-Bromopropane, 99%

ACC# 91748

Section 1 - Chemical Product and Company Identification

MSDS Name: 1-Bromopropane, 99%

Catalog Numbers: AC107310000, AC107310010, AC107310025, AC107310050, AC107312500, AC107315000 AC107315000

Synonyms: n-Propyl bromide.

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
106-94-5	1-Bromopropane	99	203-445-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: -4.5 deg C.

Warning! Flammable liquid and vapor. Breathing vapors may cause drowsiness and dizziness. Causes eye, skin, and respiratory tract irritation. May impair fertility. Harmful if inhaled. Possible risk of harm to the unborn child. May cause nervous system effects. May cause liver damage.

Target Organs: Liver, nervous system, reproductive system.

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.

Inhalation: Harmful if inhaled. Causes respiratory tract irritation. May cause liver damage. Inhalation of vapors may cause drowsiness and dizziness.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. There are not enough human data on 1-bromopropane to

determine whether the chemical has harmed human reproduction and development. However, research on lab rats shows 1-bromopropane can damage reproduction and development in that animal. Effects, such as a lengthened estrous (reproductive) cycle, occurred when female rats inhaled 1-bromopropane at concentrations of 250 ppm.

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. 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 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. Vapors may form an explosive mixture with air. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable 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: -4.5 deg C (23.90 deg F)

Autoignition Temperature: 490 deg C (914.00 deg F)

Explosion Limits, Lower:4.60 vol %

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 3; 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. Use a spark-proof tool. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. 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 container tightly closed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid breathing vapor or mist.

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.

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
1-Bromopropane	10 ppm TWA	none listed	none listed

OSHA Vacated PELs: 1-Bromopropane: 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: Liquid

Appearance: clear, colorless

Odor: pleasant odor

pH: Not available.

Vapor Pressure: 146 mm Hg @ 20 deg C

Vapor Density: 4.34 (air=1)

Evaporation Rate:Not available.
Viscosity: 0.52 mPa.s @ 20 deg C
Boiling Point: 71 deg C @ 760 mm Hg
Freezing/Melting Point:-110 deg C
Decomposition Temperature:Not available.
Solubility: 2.5 g/l (20°C)
Specific Gravity/Density:1.353 g/ml
Molecular Formula:C3H7Br
Molecular Weight:122.99

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Ignition sources, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, aluminum, zinc.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, hydrogen bromide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 106-94-5: TX4110000

LD50/LC50:

CAS# 106-94-5:

Inhalation, mouse: LC50 = 7100 mg/m³;

Inhalation, rat: LC50 = 253 gm/m³/30M;

Inhalation, rat: LC50 = 19700 mg/m³;

Oral, mouse: LD50 = 4700 mg/kg;

Oral, rat: LD50 = 3600 mg/kg;

Carcinogenicity:

CAS# 106-94-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information available.

Reproductive Effects: See actual entry in RTECS for complete information.

Mutagenicity: No information available.

Neurotoxicity: Neurotoxic effects have occurred in experimental animals.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 67.3 mg/l; 96H; LC50
Daphnia: Daphnia: 208.9 mg/l; 24H; 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:	BROMOPROPANES	BROMOPROPANES
Hazard Class:	3	3
UN Number:	UN2344	UN2344
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 106-94-5 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 # 106-94-5: 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# 106-94-5 can be found on the following state right to know lists: 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 1-Bromopropane, a chemical known to the state of California to cause male 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 F

Risk Phrases:

R 11 Highly flammable.

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 48/20 Harmful : danger of serious damage to health by prolonged exposure through inhalation.

R 60 May impair fertility.

R 63 Possible risk of harm to the unborn child.

R 67 Vapours may cause drowsiness and dizziness.

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# 106-94-5: No information available.

Canada - DSL/NDSL

CAS# 106-94-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, 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

Material Safety Data Sheet

1-Iodododecane, 98%

ACC# 69094

Section 1 - Chemical Product and Company Identification

MSDS Name: 1-Iodododecane, 98%

Catalog Numbers: AC250090000, AC250090050, AC250090250, AC250091000, AC250095000

Synonyms: Dodecyl iodide; Dodecane, 1-iodo-; n-Dodecyl iodide;

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
4292-19-7	1-Iodododecane	98	224-293-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid.

Warning! Causes eye, skin, and respiratory tract irritation. Light sensitive.

Target Organs: No data found.

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.

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 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. 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: > 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: 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. Avoid runoff into storm sewers and ditches which lead to waterways. 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. 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
1-Iodododecane	none listed	none listed	none listed

OSHA Vacated PELs: 1-Iodododecane: 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

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 10.21

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 159.0 - 160.0 deg C @ 15.00mm

Freezing/Melting Point: -3 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: 1.2010g/cm³

Molecular Formula: C₁₂H₂₅I

Molecular Weight: 296.23

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. May discolor on exposure to light.

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

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, direct light.

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

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 4292-19-7 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 4292-19-7: 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

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# 4292-19-7 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# 4292-19-7 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 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 4292-19-7: No information available.

Canada - DSL/NDSL

CAS# 4292-19-7 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

Material Safety Data Sheet

2,2,4-Trimethylpentane, p.a.

ACC# 01767

Section 1 - Chemical Product and Company Identification

MSDS Name: 2,2,4-Trimethylpentane, p.a.

Catalog Numbers: AC265440000, AC265440010, AC265440025, AC265440050

Synonyms: Isooctane; Isobutyltrimethylmethane

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
540-84-1	2,2,4-Trimethylpentane		208-759-1

Hazard Symbols: XN F N

Risk Phrases: 11 38 50/53 65 67

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available. Appearance: APHA: 10 max clear liquid. Flash Point: -12 deg C. Not available.

Target Organs: Kidneys, central nervous system, respiratory system, eyes, skin.

Potential Health Effects

Eye: May cause eye irritation. Causes redness and pain.

Skin: Causes skin irritation. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis.

Ingestion: Aspiration hazard. May cause 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. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. May cause lung damage.

Inhalation: Inhalation of high concentrations may cause central nervous system effects

characterized by nausea, headache, dizziness, unconsciousness and coma. May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. May cause narcotic effects in high concentration.

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.

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 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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Vapor may cause flash fire. Containers may explode in the heat of a fire. Liquid will float and may reignite on the surface of water. Flammable liquid and vapor.

Extinguishing Media: Use water spray to cool fire-exposed containers. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained. Use dry chemical, carbon dioxide, or alcohol-resistant foam.

Flash Point: -12 deg C (10.40 deg F)

Autoignition Temperature: 417 deg C (782.60 deg F)

Explosion Limits, Lower: 1.10 vol %

Upper: 6.00 vol %

NFPA Rating: (estimated) Health: 1; Flammability: 3; 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. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Take precautionary measures against static discharges. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation.

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

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. Ventilation fans and other electrical service must be non-sparking and have an explosion-proof design.

Exposure Limits

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

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

Personal Protective Equipment

Eyes: Not available.

Skin: Wear impervious gloves.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A NIOSH/MSHA approved or European Standard EN 149 air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected. 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: Clear liquid
Appearance: APHA: 10 max
Odor: gasoline-like
pH: Not available.
Vapor Pressure: 52 mbar @ 20 deg C
Vapor Density: 3.94 (air=1)
Evaporation Rate: < 1 (ether=1)
Viscosity: 0.51 mPas 22 deg C
Boiling Point: 98 - 99 deg C @ 760.00mm Hg
Freezing/Melting Point: -107 deg C
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density: .6920g/cm3
Molecular Formula: (CH3)2CHCH2C(CH3)3
Molecular Weight: 114.23

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat, electrical sparks.

Incompatibilities with Other Materials: Strong oxidizing agents, reducing agents, strong acids, strong bases, oxygen.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 540-84-1: SA3320000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 540-84-1: 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: Mutation & EPA: see RTECS

Other Studies: See actual entry in RTECS for complete information. The toxicological properties have not been fully investigated.

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: see "The dictionary of substances and their effects" for complete information (editor : M.L.Richardson)

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	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	OCTANES				No information available.
Hazard Class:	3				
UN Number:	UN1262				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 540-84-1 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 540-84-1: Effective Date: 6/1/87; Sunset Date: 12/19/95

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# 540-84-1: 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 # 540-84-1: acute, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

CAS# 540-84-1 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# 540-84-1 can be found on the following state right to know lists: 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:**

XN F N

Risk Phrases:

R 11 Highly flammable.

R 38 Irritating to skin.

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

R 65 Harmful: may cause lung damage if swallowed.

R 67 Vapors may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

S 9 Keep container in a well-ventilated place.

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

S 61 Avoid release to the environment. Refer to

special instructions/Safety data sheets.

S 62 If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 540-84-1: No information available.

Canada - DSL/NDSL

CAS# 540-84-1 is listed on Canada's DSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

Exposure Limits

Material Safety Data Sheet

2,6-Diethylaniline

ACC# 96756

Section 1 - Chemical Product and Company Identification

MSDS Name: 2,6-Diethylaniline

Catalog Numbers: AC165220000, AC165220010, AC165222500

Synonyms: 2,6-Diethylbenzenamine.

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
579-66-8	2,6-Diethylaniline	98	209-445-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-brown liquid.

Warning! Harmful if swallowed. May cause eye, skin, and respiratory tract irritation. May cause methemoglobinemia.

Target Organs: Blood.

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. Overexposure may cause methemoglobinemia.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled. May cause 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: 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. Get medical aid immediately. Call a poison control center.

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.

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

Flash Point: 123 deg C (253.40 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: 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: Avoid contact with eyes, skin, and 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. Store protected from light and air.

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
2,6-Diethylaniline	none listed	none listed	none listed

OSHA Vacated PELs: 2,6-Diethylaniline: 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 yellow - red-brown

Odor: None reported.

pH: Not available.

Vapor Pressure: 0.02 mm Hg @ 20 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 243 deg C @ 760 mmHg

Freezing/Melting Point: 3 - 4 deg C

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: 0.900

Molecular Formula: C₁₀H₁₅N

Molecular Weight: 149.24

Section 10 - Stability and Reactivity

Chemical Stability: Darkens on exposure to light and air. Air sensitive. Light sensitive.

Conditions to Avoid: Incompatible materials, light, exposure to air, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, acid chlorides, acid anhydrides, chloroformates.

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

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 579-66-8: BX3500000

LD50/LC50:

CAS# 579-66-8:

Oral, rat: LD50 = 1800 mg/kg;

Carcinogenicity:

CAS# 579-66-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

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:	TOXIC LIQUIDS, ORGANIC, N.O.S.	TOXIC LIQUIDS, ORGANIC, N.O.S.
Hazard Class:	6.1	6.1
UN Number:	UN2810	UN2810
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 579-66-8 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# 579-66-8 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:**

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

S 24 Avoid contact with skin.

WGK (Water Danger/Protection)

CAS# 579-66-8: 2

Canada - DSL/NDSL

CAS# 579-66-8 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

Material Safety Data Sheet

2-Methyl-1-propanol, 99%

ACC# 95678

Section 1 - Chemical Product and Company Identification

MSDS Name: 2-Methyl-1-propanol, 99%

Catalog Numbers: AC158280010, AC158280025

Synonyms: 1-Hydroxymethylpropane; Isobutanol; Isopropylcarbinol; 2-Methyl-1-Propanol.

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
78-83-1	Isobutyl alcohol	99	201-148-0

Hazard Symbols: XN F

Risk Phrases: 10 20

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: 82 deg F. **Warning! Flammable liquid and vapor.** May cause severe eye irritation and possible injury. May cause liver and kidney damage. May cause central nervous system depression. May cause skin and respiratory tract irritation.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye: May cause severe eye irritation. May cause chemical conjunctivitis and corneal damage.

Skin: May cause irritation and dermatitis. May cause cyanosis of the extremities.

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

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause respiratory tract irritation. Aspiration may lead to pulmonary edema. Vapors may cause dizziness or suffocation. May cause corneal abnormalities and loss of appetite and weight. May cause burning sensation in the chest.

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: 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: 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. Vapors may form an explosive mixture with air. 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. Will burn if involved in a fire. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Containers may explode in the heat of a fire. 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 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: 82e deg F (27.78 deg C)

Autoignition Temperature: 780 deg F (415.56 deg C)

Explosion Limits, Lower:1.7

Upper: 10.6

NFPA Rating: (estimated) Health: 1; Flammability: 3; 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. Remove all sources of ignition. Use a spark-proof tool. A vapor suppressing foam may be used to reduce vapors.

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 skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Avoid contact with 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, well-ventilated area away from incompatible substances. Flammables-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 explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Isobutyl alcohol	50 ppm TWA	50 ppm TWA; 150 mg/m ³ TWA 1600 ppm IDLH	100 ppm TWA; 300 mg/m ³ TWA

OSHA Vacated PELs: Isobutyl alcohol: 50 ppm TWA; 150 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. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: colorless
Odor: mild odor
pH: Not available.
Vapor Pressure: 12.2 mm Hg @ 25C
Vapor Density: 2.6 (air=1)
Evaporation Rate:0.8 (butyl acetone=1)
Viscosity: 4 CP @ 20C
Boiling Point: 226 deg F
Freezing/Melting Point:-162 deg F
Decomposition Temperature:Not available.
Solubility: Soluble in water.
Specific Gravity/Density:0.802 (water=1)
Molecular Formula:C4H10O
Molecular Weight:74.0694

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: High temperatures, incompatible materials, ignition sources, 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# 78-83-1: NP9625000
LD50/LC50:
CAS# 78-83-1:
Inhalation, mouse: LC50 = 15500 mg/m³/2H;
Inhalation, rabbit: LC50 = 2630 mg/m³/4H;

Inhalation, rat: LC50 = 19200 mg/m³/4H;
Oral, mouse: LD50 = 3500 mg/kg;
Oral, rabbit: LD50 = 74.1 mg/kg;
Oral, rat: LD50 = 2460 mg/kg;
Skin, rabbit: LD50 = 3400 mg/kg;<BR.

Carcinogenicity:

CAS# 78-83-1: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information found.

Teratogenicity: No information found.

Reproductive Effects: No information found.

Neurotoxicity: No information found.

Mutagenicity: No information found.

Other Studies: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 1430g/L; 96H; No data available.

Environmental: Terrestrial: When spilled on soil, isobutyl alcohol will both evaporate and leach into the ground due to its relatively high vapor pressure and low adsorption to soil.

Aquatic: When released into water, isobutyl alcohol will volatilize (half-life in a river approximately 4 days). Atmospheric: When released into the atmosphere, isobutyl alcohol will photodegrade with a half-life ranging from hours in polluted urban atmospheres, to days in cleaner atmospheres.

Physical: Readily biodegrades but not bioconcentrate.

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: CAS# 78-83-1: waste number U140 (Ignitable waste, Toxic waste).

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	ISOBUTANOL				No

					information available.
Hazard Class:	3				
UN Number:	UN1212				
Packing Group:	III				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 78-83-1 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 78-83-1: Effective Date: 3/7/86; Sunset Date: 3/7/96

Chemical Test Rules

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

Section 12b

CAS# 78-83-1: 4/12b

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# 78-83-1: 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 # 78-83-1: 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:

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# 78-83-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, 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:

XN F

Risk Phrases:

R 10 Flammable.

R 20 Harmful by inhalation.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 33 Take precautionary measures against static discharges.

S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 78-83-1: 1

Canada - DSL/NDSL

CAS# 78-83-1 is listed on Canada's DSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

CAS# 78-83-1 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 78-83-1: OEL-AUSTRALIA:TWA 50 ppm (150 mg/m³) OEL-AUSTRIA:TWA 100 ppm (300 mg/m³) OEL-BELGIUM:TWA 50 ppm (152 mg/m³) OEL-DENMARK:STEL 50 ppm (150 mg/m³);Skin OEL-FRANCE:TWA 50 ppm (150 mg/m³) OEL-GERMANY:TWA 100 ppm (300 mg/m³) OEL-JAPAN:TWA 50 ppm (150 mg/m³) OEL-THE NETHERLANDS:TWA 50 ppm (150 mg/m³) OEL-THE PHILIPPINES:TWA 100 ppm (300 mg/m³) OEL-RUSSIA:TWA 50 ppm;STEL 10 mg/m³;Skin OEL-SWITZERLAND:TWA 50 ppm (150 mg/m³);STEL 100 ppm (300 mg/m³) OEL-UNITED KINGDOM:TWA 50 ppm (150 mg/m³);STEL 75 ppm OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGIH TLV

Material Safety Data Sheet

2-Nitro-m-xylene

ACC# 56948

Section 1 - Chemical Product and Company Identification

MSDS Name: 2-Nitro-m-xylene

Catalog Numbers: AC129080000, AC129080050, AC129081000, AC129082500, AC129085000

Synonyms: 1,3-Dimethyl-2-nitrobenzene.

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
81-20-9	2-Nitro-m-xylene	99	201-333-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear yellow liquid. Flash Point: 87 deg C.

Warning! Harmful if absorbed through skin or if inhaled. May cause eye, skin, and respiratory tract irritation. **Combustible liquid and vapor.**

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Harmful if absorbed through the skin.

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

Inhalation: Harmful if inhaled. 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 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.

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. Combustible liquid and vapor.

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

Flash Point: 87 deg C (188.60 deg F)

Autoignition Temperature: Not available.

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: 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). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container.

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 only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2-Nitro-m-xylene	none listed	none listed	none listed

OSHA Vacated PELs: 2-Nitro-m-xylene: 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 yellow

Odor: aromatic odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 5.21

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 225 deg C @ 760 mmHg

Freezing/Melting Point: 14 - 16 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 1.110

Molecular Formula: C₈H₉NO₂

Molecular Weight: 151.16

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.

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

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 81-20-9: ZE4686000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 81-20-9: 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 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:	NITROXYLENES LIQUID	NITROXYLENES LIQUID
Hazard Class:	6.1	6.1
UN Number:	UN1665	UN1665
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 81-20-9 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# 81-20-9 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 20/21 Harmful by inhalation and in contact with skin.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 81-20-9: 2

Canada - DSL/NDSL

CAS# 81-20-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, 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

2,4-Dimethoxybenzaldehyde

ACC# 95954

Section 1 - Chemical Product and Company Identification

MSDS Name: 2,4-Dimethoxybenzaldehyde

Catalog Numbers: AC115380000, AC115380250, AC115381000

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
613-45-6	2,4-Dimethoxybenzaldehyde	98	210-342-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white 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 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 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
2,4-Dimethoxybenzaldehyde	none listed	none listed	none listed

OSHA Vacated PELs: 2,4-Dimethoxybenzaldehyde: 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 brown - white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 165 deg C @ 10 mmHg

Freezing/Melting Point: 68 - 72 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: Not available.

Molecular Formula: C₉H₁₀O₃

Molecular Weight: 166.18

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 bases.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 613-45-6 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 613-45-6: 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# 613-45-6 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# 613-45-6 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:

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# 613-45-6: 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

Material Safety Data Sheet

4-Heptyloxybenzoyl chloride, 99%

ACC# 07823

Section 1 - Chemical Product and Company Identification

MSDS Name: 4-Heptyloxybenzoyl chloride, 99%

Catalog Numbers: AC206570000, AC206570050

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
40782-54-5	4-heptyloxybenzoyl chloride	99	255-077-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear light yellow liquid.

Danger! Corrosive. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. Moisture sensitive.

Target Organs: No data found.

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 systemic effects.

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. Aspiration may lead to pulmonary edema. May cause systemic effects.

Chronic: Effects may be delayed.

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. 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. 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 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: Do NOT get water inside containers. In case of fire, use carbon dioxide, dry chemical powder or appropriate foam.

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

Autoignition Temperature: Not applicable.

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. 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. Do not breathe dust, mist, or vapor. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Do not allow contact with water. Discard contaminated shoes. Keep from contact with moist air and steam.

Storage: Corrosives area. Keep containers tightly closed. Store protected from moisture. 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
4-heptyloxybenzoyl chloride	none listed	none listed	none listed

OSHA Vacated PELs: 4-heptyloxybenzoyl 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: Liquid

Appearance: clear light yellow

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 8.78
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 226.0 - 227.0 deg C @ 30.00mm
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: May decompose.
Specific Gravity/Density: 1.0610g/cm³
Molecular Formula: C₁₄H₁₉ClO₂
Molecular Weight: 254.76

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Moisture sensitive.
Conditions to Avoid: Incompatible materials, moisture, strong oxidants.
Incompatibilities with Other Materials: Moisture, water, alcohols, oxidizing agents, strong bases.
Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon monoxide, carbon dioxide, phosgene gas.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 40782-54-5 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 40782-54-5: 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:	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# 40782-54-5 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# 40782-54-5 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:

C

Risk Phrases:

R 34 Causes burns.

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.

WGK (Water Danger/Protection)

CAS# 40782-54-5: 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

Material Safety Data Sheet

4-Nitrophenol

ACC# 96371

Section 1 - Chemical Product and Company Identification

MSDS Name: 4-Nitrophenol

Catalog Numbers: AC157050000, AC157050050, AC157052500, AC220950000, AC220950500, 15705-0010, 15705-1000, BP612-1

Synonyms: 4-Hydroxynitrobenzene; p-Nitrophenol.

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
100-02-7	4-Nitrophenol	98+	202-811-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow crystals.

Warning! Harmful if swallowed, inhaled, or absorbed through the skin. May cause allergic respiratory reaction. May cause eye, skin, and respiratory tract irritation. Danger of cumulative effects.

Target Organs: Kidneys, central nervous system, liver, respiratory system, skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Harmful if absorbed through the skin. Substance is readily 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. Effects may be delayed 2 to 4 hours.

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: Harmful if inhaled. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). May cause respiratory tract irritation. May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause nausea and possible vomiting. May cause methemoglobinemia.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. There is a danger of cumulative effects. 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. Containers may explode in the heat of a fire. Vapors or dust may form explosive mixture with air.

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

Flash Point: 169 deg C (336.20 deg F)

Autoignition Temperature: 283 deg C (541.40 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: 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. 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 only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
4-Nitrophenol	none listed	none listed	none listed

OSHA Vacated PELs: 4-Nitrophenol: 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: brown - yellow

Odor: phenol-like
pH: 4.4 (5 g/L aq.sol.)
Vapor Pressure: Not available.
Vapor Density: 4.8 (air=1)
Evaporation Rate:Not available.
Viscosity: 2.56 mPa @ 121 deg C
Boiling Point: 279 deg C @ 760 mmHg
Freezing/Melting Point:> 112 deg C
Decomposition Temperature:279 deg C
Solubility: Soluble.
Specific Gravity/Density:Not available.
Molecular Formula:C6H5NO3
Molecular Weight:139.11

Section 10 - Stability and Reactivity

Chemical Stability: Light sensitive. Heat sensitive
Conditions to Avoid: Incompatible materials, light, dust generation, temperatures above 75°C (167°F), heat.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, caustic alkalis, combustible materials.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, phenol.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 100-02-7: SM2275000
LD50/LC50:
CAS# 100-02-7:
Dermal, guinea pig: LD50 = >1 gm/kg;
Oral, mouse: LD50 = 282 mg/kg;
Oral, rat: LD50 = 202 mg/kg;
Skin, rat: LD50 = 1024 mg/kg;
.
Inhalation, rat: LC50 = > 4.7 mg/l/4H.; Skin sensitization, guinea pig: None sensitized. (Eastman Kodak).
Carcinogenicity:
CAS# 100-02-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in experimental animals.

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:

CAS# 100-02-7: waste number U170.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NITROPHENOLS	NITROPHENOLS
Hazard Class:	6.1	6.1
UN Number:	UN1663	UN1663
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 100-02-7 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 100-02-7: Effective 4/13/89, Sunset 6/30/98

Chemical Test Rules

CAS# 100-02-7: 40 CFR 799.5055

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# 100-02-7: 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 # 100-02-7: immediate, delayed, reactive.

Section 313

This material contains 4-Nitrophenol (CAS# 100-02-7, 98+%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

CAS# 100-02-7 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:

CAS# 100-02-7 is listed as a Hazardous Substance under the CWA. CAS# 100-02-7 is listed as a Priority Pollutant under the Clean Water Act.

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# 100-02-7 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 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 33 Danger of cumulative effects.

Safety Phrases:

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

WGK (Water Danger/Protection)

CAS# 100-02-7: 2

Canada - DSL/NDSL

CAS# 100-02-7 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# 100-02-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

8-Hydroxyquinoline

ACC# 30450

Section 1 - Chemical Product and Company Identification

MSDS Name: 8-Hydroxyquinoline

Catalog Numbers: AC121900000, AC121900250, AC121901000, AC121905000, AC173110000, AC173110250, AC173111000, AC424240000, AC424241000, AC424245000, BP436-100, O261-100, O261-500

Synonyms: Bioquin; 8-Oxyquinoline; Oxin; Oxine; Oxybenzopyridine; Hydroxybenzopyridine; Phenopyridine; 8-Quinol; 8-Quinolinol.

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
148-24-3	8-Hydroxyquinoline	>99	205-711-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slightly beige flakes.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if swallowed. Possible risks of irreversible effects.

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 gastrointestinal irritation with nausea,

vomiting and diarrhea. Based on studies with laboratory animals, oral doses may cause anorexia, malaise, confusion, respiratory difficulty, paralysis, and other CNS effects.

Inhalation: Dust is irritating to the respiratory tract. Symptoms may include coughing, labored breathing and chest pain. Other health effects may parallel those from ingestion.

Chronic: Possible risk of irreversible effects. In rats, orally administered 8-hydroxyquinoline produced deposition of iron in many tissues. This effect was increased by increasing the amount of available iron in 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 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: 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. 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 chemical foam.

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: 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. Do not breathe dust.

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
8-Hydroxyquinoline	none listed	none listed	none listed

OSHA Vacated PELs: 8-Hydroxyquinoline: 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: light yellow - slightly beige

Odor: odorless

pH: Not available.

Vapor Pressure: 4.7 hPa @100 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.
Boiling Point: 267 deg C @ 752 mmHg
Freezing/Melting Point:72 - 74 deg C
Decomposition Temperature:Not available.
Solubility: Almost insoluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:C9H7NO
Molecular Weight:145.16

Section 10 - Stability and Reactivity

Chemical Stability: Darkens and decomposes on exposure to light. Light sensitive.
Conditions to Avoid: Incompatible materials, light, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids.
Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon dioxide, nitrogen gas.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 148-24-3: VC4200000
LD50/LC50:
CAS# 148-24-3:
Draize test, rabbit, eye: 100 mg Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, rat: LC50 = >1210 mg/m³/6H;
Oral, mouse: LD50 = 20 gm/kg;
Oral, rat: LD50 = 1200 mg/kg;

Carcinogenicity:
CAS# 148-24-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: There was no evidence of an increase in birth defects in 21 women treated with 8-hydroxyquinoline during the first 16 weeks of pregnancy.
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: No data available. EC50 (30 min) Photobacterium phosphoreum: 2.3 mg/L Microtox test.

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:	TOXIC SOLID, ORGANIC, N.O.S. (8-Hydroxyquinoline)	TOXIC SOLID, ORGANIC, N.O.S. (8-Hydroxyquinoline)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 148-24-3 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 # 148-24-3: 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# 148-24-3 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.

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

WGK (Water Danger/Protection)

CAS# 148-24-3: 3

Canada - DSL/NDSL

CAS# 148-24-3 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# 148-24-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

9-Fluorenone, 99+% (gc)

ACC# 96869

Section 1 - Chemical Product and Company Identification

MSDS Name: 9-Fluorenone, 99+% (gc)

Catalog Numbers: AC119200000, AC119200050, AC119201000, AC119205000

Synonyms: Fluoren-9-one; 9-Fluorenone; 9H-Fluoren-9-one; 9-Oxofluorene; Diphenylene ketone

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
486-25-9	9-Fluorenone	99+	207-630-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow, rhombic crystals crystals.

Caution! Questionable carcinogen. 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: Skin.

Potential Health Effects

Eye: May cause eye irritation.

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.

Chronic: Animal studies have reported the development of tumors.

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.

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

Flash Point: 163 deg C (325.40 deg F)

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: 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: 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
9-Fluorenone	none listed	none listed	none listed

OSHA Vacated PELs: 9-Fluorenone: 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: yellow, rhombic crystals

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 342 deg C @ 760.00mmHg

Freezing/Melting Point: 82.00 - 85.00 deg C

Decomposition Temperature: Not available.

Solubility: insoluble

Specific Gravity/Density: 1.1300 @ 99 C/4 C

Molecular Formula: C₁₃H₈O

Molecular Weight: 180.21

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: Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 486-25-9: LL8925000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 486-25-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Tumorigenic: Subcutaneous, rat: TDLo = 300 mg/kg/26W-I (Skin and appendage tumors).

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. 9-Fluorenone exists in both the vapor and particulate phases in the ambient atmosphere and will be degraded by reaction with photochemically produced hydroxyl radicals. Estimated Koc value = 2300. This value indicates that this product is expected to adsorb to sediments and suspended matter in water and will show only slight mobility in soil. Estimated BCF value = 310. This value suggests that bioconcentration in the aquatic environment and organisms will be an important fate process.

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# 486-25-9 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# 486-25-9 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# 486-25-9: 1

Canada - DSL/NDSL

CAS# 486-25-9 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

Acetone

ACC# 89909

Section 1 - Chemical Product and Company Identification

MSDS Name: Acetone

Catalog Numbers: 57025

Synonyms: Dimethylformaldehyde; Dimethyl ketone; 2-Propanone; Pyroacetic acid; Pyroacetic ether.

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
67-64-1	Acetone	100.0	200-662-2

Hazard Symbols: XI F

Risk Phrases: 11 36 66 67

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colourless. Flash Point: -4 deg F. Causes respiratory tract irritation. Causes eye irritation. Breathing vapors may cause drowsiness and dizziness. Prolonged or repeated contact may dry the skin and cause irritation. **Danger!** Extremely flammable liquid and vapor. Vapor may cause flash fire.

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

Potential Health Effects

Eye: Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury.

Skin: May be 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 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 high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause motor incoordination and speech abnormalities.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation may cause effects similar to those of acute inhalation.

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: 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. 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: 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. 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. May be ignited by heat, sparks, and flame. 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: 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. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: -4e deg F (-20.00 deg C)

Autoignition Temperature: 869 deg F (465.00 deg C)

Explosion Limits, Lower:2.5%

Upper: 12.8%

NFPA Rating: (estimated) Health: 1; Flammability: 3; 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. Wear appropriate protective clothing to minimize contact with skin. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces. Clean up residual material by washing area with a 2-5% solution of soda ash.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. 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. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame.

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. Flammables-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
Acetone	500 ppm TWA; 750 ppm STEL	250 ppm TWA; 590 mg/m ³ TWA 2500 ppm IDLH	1000 ppm TWA; 2400 mg/m ³ TWA

OSHA Vacated PELs: Acetone: 750 ppm TWA; 1800 mg/m³ TWA

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: colourless

Odor: acetone-like

pH: 7

Vapor Pressure: 180 mm Hg

Vapor Density: 2.0 (Air=1)

Evaporation Rate: 7.7 (n-Butyl acetate=1)

Viscosity: Not available

Boiling Point: 133.2 deg F

Freezing/Melting Point: -139.6 deg F

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 0.79 (Water=1)

Molecular Formula: C₃H₆O

Molecular Weight: 58.08

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, ignition sources, temperatures above 220°C.

Incompatibilities with Other Materials: Strong acids, 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# 67-64-1: AL3150000

LD50/LC50:

CAS# 67-64-1:

Dermal, guinea pig: LD50 = >9400 uL/kg;

Draize test, rabbit, eye: 10 uL Mild;

Draize test, rabbit, eye: 20 mg Severe;

Draize test, rabbit, eye: 20 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, mouse: LC50 = 44 gm/m³/4H;

Inhalation, rat: LC50 = 50100 mg/m³/8H;

Oral, mouse: LD50 = 3 gm/kg;

Oral, rabbit: LD50 = 5340 mg/kg;

Oral, rat: LD50 = 5800 mg/kg;<BR.

Carcinogenicity:

CAS# 67-64-1:

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: TDLo(Oral, rat) = 273 gm/kg; Reproductive - Paternal Effects - spermatogenesis (incl. genetic material, sperm morphology, motility, and count).

Neurotoxicity: No information available.

Mutagenicity: Sex chromosome loss and nondisjunction(Yeast - *Saccharomyces cerevisiae*) = 47600 ppm; Cytogenetic analysis(Rodent - hamster Fibroblast)= 40 gm/L.

Other Studies: Standard Draize Test: Administration onto the skin (human) = 500 mg/7days (Mild). Standard Draize Test: Administration onto the skin (rabbit) = 500 mg/24H (Mild). Standard Draize Test(Eye, Rabbit) = 20 mg; Severe.

Section 12 - Ecological Information

Ecotoxicity: Material Safety Data Sheet Brown trout: ; ; Rainbow trout LC50=5540 mg/L/96H Sunfish (tap water), death at 14250 ppm/24H Mosquito fish (turbid water) TLm=13000 ppm/48HCas# 67-64-1:LC50 (96Hr.) rainbow trout = 5540 mg/L; Static conditions, 11-13 degrees CLC50 (96Hr) Fathead Minnow = 7280-8120 mg/L; Flow-through ConditionsLC50 (96Hr) Bluegill = 8300 mg/L

Environmental: Volatilizes, leeches, and biodegrades when released to soil. TERRESTRIAL FATE: If released on soil, acetone will both volatilize and leach into the ground. Acetone readily biodegrades and there is evidence suggesting that it biodegrades fairly rapidly in soils. AQUATIC FATE: If released into water, acetone will probably biodegrade. It is readily biodegradable in screening tests, although data from natural water are lacking. It will also be lost due to volatilization (estimated half-life 20 hr from a model river). Adsorption to sediment should not be significant.

Physical: ATMOSPHERIC FATE: In the atmosphere, acetone will be lost by photolysis and reaction with photochemically produced hydroxyl radicals. Half-life estimates from these combined processes are 79 and 13 days in January and June, respectively, for an overall annual average of 22 days. Therefore considerable dispersion should occur. Being miscible in water, wash out by rain should be an important removal process. This process has been confirmed around Lake Shinsei-ko in Japan. There acetone was found in the air and rain as well as the lake.

Other: Not expected to bioconcentrate in fish. he recommended log octanol/water partition coefficient for acetone is -0.24 and therefore its potential for bioconcentration in fish is

negligible. One experimental study of bioconcentration in adult haddock at 7-9 deg C (static test), resulted in a BCF of 0.69.

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# 67-64-1: waste number U002 (Ignitable waste).

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				ACETONE
Hazard Class:					3
UN Number:					UN1090
Packing Group:					II
Additional Info:					FLASHPOINT -20 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 67-64-1 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

CAS# 67-64-1: 4/12b

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# 67-64-1: 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 # 67-64-1: 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 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# 67-64-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, 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:**

XI F

Risk Phrases:

R 11 Highly flammable.

R 36 Irritating to eyes.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapors may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

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

S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 67-64-1: 0

Canada - DSL/NDSL

CAS# 67-64-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2B.

Canadian Ingredient Disclosure List

CAS# 67-64-1 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 67-64-1: OEL-AUSTRALIA:TWA 500 ppm (1185 mg/m³);STEL 1000 ppm

OEL-AUSTRIA:TWA 750 ppm (1780 mg/m³) OEL-BELGIUM:TWA 750 ppm (1780 mg

/m3);STEL 1000 pp OEL-CZECHOSLOVAKIA:TWA 800 mg/m3;STEL 4000 mg/m3 O
EL-DENMARK:TWA 250 ppm (600 mg/m3) OEL-FINLAND:TWA 500 ppm (1200 mg/m
3);STEL 625 ppm (1500 mg/m3) OEL-FRANCE:TWA 750 ppm (1800 mg/m3) OEL
-GERMANY:TWA 1000 ppm (2400 mg/m3) OEL-HUNGARY:TWA 600 mg/m3;STEL 120
0 mg/m3 OEL-INDIA:TWA 750 ppm (1780 mg/m3);STEL 1000 ppm (2375 mg/m3)
OEL-JAPAN:TWA 200 ppm (470 mg/m3) OEL-THE NETHERLANDS:TWA 750 ppm (
1780 mg/m3) JAN9 OEL-THE PHILIPPINES:TWA 1000 ppm (2400 mg/m3) OEL-P
OLAND:TWA 200 mg/m3 OEL-RUSSIA:TWA 200 ppm;STEL 200 mg/m3 OEL-SWEDEN
:TWA 250 ppm (600 mg/m3);STEL 500 ppm (1200 mg/m3) OEL-SWITZERLAND:TW
A 750 ppm (1780 mg/m3) OEL-TURKEY:TWA 1000 ppm (2400 mg/m3) OEL-UNIT
ED KINGDOM:TWA 750 ppm (1810 mg/m3);STEL 1250 ppm OEL IN BULGARIA, CO
LOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE,
VIETNAM check ACGI TLV

Material Safety Data Sheet

Acetylacetone, 97%

ACC# 50524

Section 1 - Chemical Product and Company Identification

MSDS Name: Acetylacetone, 97%

Catalog Numbers: AC102400000, AC102400050, AC102401000, AC102402500, AC102405000

Synonyms: 2,5-Hexanedione.

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
110-13-4	Acetylacetone	97	203-738-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear slight brown liquid. Flash Point: 78 deg C.

Warning! Causes eye, skin, and respiratory tract irritation. **Combustible liquid and vapor.** May cause central nervous system effects.

Target Organs: Central nervous system.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system effects.

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: 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.

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. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode if exposed to fire. Combustible liquid and vapor.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: 78 deg C (172.40 deg F)

Autoignition Temperature: 400 deg C (752.00 deg F)

Explosion Limits, Lower: 1.50 vol %

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: 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. Remove all sources of ignition. Use a spark-proof tool. 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 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. Keep away from heat and flame.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Keep container closed when not in use.

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
Acetylacetone	none listed	none listed	none listed

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

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

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: Liquid

Appearance: clear slight brown

Odor: Not available.

pH: Not available.

Vapor Pressure: 0.57 mbar @ 20

Vapor Density: 3.9 (air = 1)

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 191 deg C @ 760 mm Hg

Freezing/Melting Point: -6 deg C

Decomposition Temperature: Not available.

Solubility: miscible
Specific Gravity/Density: .9730g/cm³
Molecular Formula: C₆H₁₀O₂
Molecular Weight: 114.14

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Ignition sources, 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# 110-13-4: MO3150000
LD50/LC50:
CAS# 110-13-4:
Dermal, guinea pig: LD50 = 6.6 mL/kg;
Draize test, rabbit, eye: 100 mg Severe;
Draize test, rabbit, eye: 100 mg/24H Moderate;
Inhalation, rat: LC50 = 2000 ppm/4H;
Oral, mouse: LD50 = 2386 mg/kg;
Oral, rat: LD50 = 1600 mg/kg;

Carcinogenicity:
CAS# 110-13-4: 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# 110-13-4 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 # 110-13-4: 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# 110-13-4 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 23 Do not inhale gas/fumes/vapour/spray.

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

WGK (Water Danger/Protection)

CAS# 110-13-4: No information available.

Canada - DSL/NDSL

CAS# 110-13-4 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

MATHESON TRI-GAS, INC. -- ACETYLACETONE --

=====
===== Product Identification =====

Product ID:ACETYLACETONE
MSDS Date:Jan 24 1989
MSDS Number: EEEQU
Kit Part:=== Responsible Party ===
Company Name:MATHESON TRI-GAS, INC.
Address:959 ROUTE 46 EAST
City:PARSIPPANY
State:NJ
ZIP:07054-0624
Country:US
Info Phone Num:(USA) 973-257-1100, (WHITBY) 905-668-3570, (EDMONTON)
780-471-4036

Chemtrec Ind/Phone:18004249300

==== Contractor Identification ====

Company Name:MATHESON TRI-GAS, INC.
Address:959 ROUTE 46 EAST
Box:City:PARSIPPANY
State:NJ
ZIP:07054-0624
Country:US
Phone:(USA) 973-257-1100, (WHITBY) 905-668-3570, (EDMONTON)
780-471-4036

CAGE:Company Name:MATHESON TRI-GAS, INC.
Address:530 WATSON STREET
Box:City:WHITBY
State:ZIP:L1N 5R9
Country:ONTARIO, CANADA
Phone:(USA) 973-257-1100, (WHITBY) 905-668-3570, (EDMONTON)
780-471-4036

CAGE:

=====
===== Composition/Information on Ingredients =====

Ingred Name:ACETYLACETONE
CAS:123-54-6
Fraction by Wt: 100.0%

=====
===== Hazards Identification =====

Reports of Carcinogenicity:NTP:No IARC:No OSHA:No
Health Hazards Acute and Chronic:INHALATION: SHORT TERM EXPOSURE:
irritation, nausea, vomiting, headache, symptoms of drunkenness
LONG TERM EXPOSURE: no information on significant adverse effects
SKIN CONTACT: SHORT TERM EXPOSURE: irritation LONG TERM EXPOSURE:
same as effects reported in short term exposure EYE CONTACT: SHORT
TERM EXPOSURE: irritation LONG TERM EXPOSURE: same as effects
reported in short term exposure INGESTION: SHORT TERM EXPOSURE:
nausea, vomiting, stomach pain, headache, symptoms of drunkenness
LONG TERM EXPOSURE: no information on significant adverse effects
Medical Cond Aggravated by Exposure:

=====
===== First Aid Measures =====

First Aid: INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention. SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse. EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention. INGESTION: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately. NOTE TO PHYSICIAN: For ingestion, consider gastric lavage and activated charcoal slurry.

===== Fire Fighting Measures =====

Flash Point:93 F (34 C) (CC)
Autoignition Temp:644 F (340 C)
Lower Limits:2.4%
Upper Limits:11.6%
Extinguishing Media:alcohol resistant foam, carbon dioxide, regular dry chemical, water, alcohol resistant foam Large fires: Use regular foam or flood with fine water spray.
Fire Fighting Procedures:Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material ocombustion by-products. Stay upwind and keep out of low areas.
Unusual Fire/Explosion Hazard:Severe fire hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive above flash point.

===== Accidental Release Measures =====

Spill Release Procedures:Avoid heat, flames, sparks and other sources of ignition. Remove sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.
Neutralizing Agent:

=====
===== Handling and Storage =====

Handling and Storage Precautions:Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Keep separated from incompatible substances.

Other Precautions:

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. For Unknown Concentrations or Immediately Dangerous to Life or Health - Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

Ventilation:Provide local exhaust or process enclosure ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

Protective Gloves:Wear appropriate chemical resistant gloves.

Eye Protection:Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Other Protective Equipment:Wear appropriate chemical resistant clothing.

Supplemental Safety and Health

ACETYLACETONE: 20 ppm recommended TWA 8 hour(s) (UNION CARBIDE)

=====
===== Physical/Chemical Properties =====

Boiling Pt:282-284 F (139-140 C)

Melt/Freeze Pt:-9 F (-23 C)

Vapor Pres:7 mmHg @ 20 C

Vapor Density:3.5

Spec Gravity:0.9721 @ 25 C

pH:Not available

Evaporation Rate & Reference:0.75 (butyl acetate=1)

Solubility in Water:12.5%

Appearance and Odor:PHYSICAL STATE:liquid APPEARANCE:ANCE: darkens on exposure to light COLOR:colorless to yellow ODOR:Not available

Corrosion Rate:

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:Stable at normal temperatures and pressure.

Stability Condition to Avoid:Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed

to heat.

Hazardous Decomposition Products:Thermal decomposition products: oxides of carbon
Thermal decomposition products: oxides of carbon
Conditions to Avoid Polymerization:Will not polymerize.

===== Toxicological Information =====

Toxicological Information:ACETYLACETONE: IRRITATION DATA: 10 mg/24 hour(s) open skin-rabbit; 488 mg open skin-rabbit mild; 20 mg eyes-rabbit severe TOXICITY DATA: 810 ul/kg skin-rabbit LD50; 55 mg/kg oral-rat LD50 LOCAL EFFECTS: Irritant: inhalation, skin, eye ACUTE TOXICITY LEVEL: Toxic: dermal absorption, ingestion TARGET ORGANS: central nervous system MUTAGENIC DATA: Available. REPRODUCTIVE EFFECTS DATA: Available.

===== Ecological Information =====

Ecological:ECOTOXICITY DATA: FISH TOXICITY: 74300 ug/L 96 hour(s) LC50 (Mortality) Bluegill (Lepomis macrochirus) INVERTEBRATE TOXICITY: <870 ug/L 7 hour(s) MATC (Reproduction) Water flea (Ceriodaphnia reticulata) ALGAL TOXICITY: 8500 ug/L 8 hour(s) (Population Growth) Blue-green algae (Anacystis aeruginosa) OTHER TOXICITY: 73900 ug/L 96 hour(s) LC50 (Mortality) Bullfrog (Rana catesbeiana)

===== Disposal Considerations =====

Waste Disposal Methods:Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. Dispose in accordance with all applicable regulations.

===== MSDS Transport Information =====

Transport Information:U.S. DOT 49 CFR 172.101: PROPER SHIPPING NAME: Flammable liquids, n.o.s. (acetylacetone) ID NUMBER: UN1993 HAZARD CLASS OR DIVISION: 3 PACKING GROUP: III LABELING REQUIREMENTS: Flammable liquid

===== Regulatory Information =====

SARA Title III Information: SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated. SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated. SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21): ACUTE: Yes CHRONIC: No FIRE: Yes REACTIVE: No SUDDEN RELEASE: No SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

Federal Regulatory Information:CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated. OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

State Regulatory Information: California Proposition 65: Not regulated.

===== Other Information =====

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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.

SHAPE PRODUCTS CO -- POTASSIUM ACID PHTHALATE -- 6810-00-275-8134

=====
Product Identification
=====

Product ID:POTASSIUM ACID PHTHALATE
MSDS Date:01/01/1987
FSC:6810
NIIN:00-275-8134
MSDS Number: BDSJK
=== Responsible Party ===
Company Name:SHAPE PRODUCTS CO
Emergency Phone Num:(415)893-0313
CAGE:DO984
=== Contractor Identification ===
Company Name:SHAPE PRODUCTS
Address:1127 57TH AVE.
Box:City:OAKLAND
State:CA
ZIP:94621-4427
Country:US
Phone:510-534-1186 OR 800-444-0015
CAGE:3D869
Company Name:SHAPE PRODUCTS CO.
Address:1127 57TH AVE.
City:OAKLAND
State:CA
ZIP:94621-4427
Country:US
Phone:415-534-1186
CAGE:DO984

=====
Composition/Information on Ingredients
=====

Ingred Name:POTASSIUM HYDROGEN PHTHALATE
Fraction by Wt: >98%
ACGIH TLV:NOT SPECIFIED

=====
Hazards Identification
=====

Effects of Overexposure:PER MFR ITEM NOT HARMFUL TO HUMAN:MAY IRRITATE
EYES OR SKIN ON PROLONGED CONTACT.

=====
Fire Fighting Measures
=====

Flash Point:NONE
Extinguishing Media:USE ANY MEDIA FOR SURROUNDING FIRES.
Fire Fighting Procedures:USE NIOSH APPROVED SCBA IF NEEDED.
Unusual Fire/Explosion Hazard:NONE NOTED

=====
Accidental Release Measures
=====

Spill Release Procedures:USE PROPER PERSONAL PROTECTION;RECOVER FOR
PROPER DISPOSAL

=====
Handling and Storage
=====

Handling and Storage Precautions:STORE IN DRY AND COOL AREA KEEP

CONTAINER CLOSED WHEN NOT IN USE.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NO SPECIAL REQMENTS UNDER ORDINARY
CONDITIONS/ADEQUATE VENT.
Ventilation:NO SPECIAL REQUIREMENTS W ADEQUATE VENT.
Protective Gloves:IMPERVIOUS
Eye Protection:GOGGLES
Other Protective Equipment:AS REQUIRED TO PREVENT PROLONGED CONTACT.
Supplemental Safety and Health
MSDS UNDATED.

=====
===== Physical/Chemical Properties =====

HCC:N1
Spec Gravity:1.636
Solubility in Water:APPRECIABLE
Appearance and Odor:WHITE CRYSTALLINE -ODOR FREE
Percent Volatiles by Volume:NONE

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NOT SPECIFIED
Stability Condition to Avoid:NONE NOTED
Hazardous Decomposition Products:NOT SPECIFIED

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particular situation.

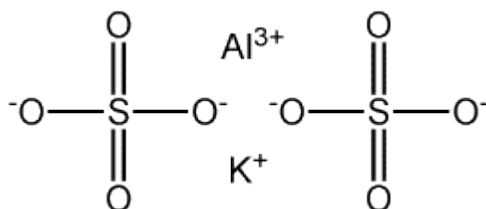
Potassium alum

- Alum
- Aluminum potassium sulfate
- Burnt alum
- Dialuminum dipotassium sulfate
- Sulfuric acid, aluminum potassium salt (2:1:1)

Formula

$KAl(SO_4)_2$

Structure



Description

Colorless, crystalline, odorless powder.

Uses

In dyeing, printing fabrics, manufacture dyes, lakes, paper, vegetable glue.

Registry Numbers and Inventories.

CAS	10043-67-1
NIH PubChem CID	24856
EC (EINECS/ELINCS)	233-141-3
RTECS	WS5650000
RTECS class	Mutagen
Merck	12,373
Beilstein/Gmelin	38649 (G)
EPA OPP	128899
Swiss Giftliste 1	G-1052
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

$KAlO_8S_2$

Formula mass	258.21
Melting point, °C	92.5
Density	1.725 g/cm ³ (20 C)
Solubility in water	568 g/L (20 C)

Hazards and Protection.

Storage	Keep tightly closed in a cool dry location. Store only with compatible chemicals.
Handling	Avoid contact with skin, eyes and clothing. Laboratory use only. Use in a chemical hood with proper protection.
Protection	Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Wear chemical resistant gloves. To prevent repeated or prolonged skin contact, wear impervious clothing and boots.
Respirators	NIOSH/MSHA approved respirator for exposures of concern.
Small spills/leaks	Evacuate and ventilate area. Wear appropriate protective equipment. Sweep up and place in appropriate container and hold for disposal. Wash contaminated surfaces.
Stability	Stable @ ambient temperature potassium alum dodecahydrate when kept long time @ 60-65 C (or over sulfuric acid) loses 9 h ₂ O which is reabsorbed on exposure to air.
Incompatibilities	Strong oxidizing agents.
Decomposition	Toxic and corrosive fumes.

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.
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Health.

Exposure limit(s)	OSHA: PEL (8 h TWA): 15 mg/m ³ .
Poison Class	5
Exposure effects	Aluminum accumulates in brain tissue and is a neurotoxic agent. Ataxia and seizures have been reported following ingestions and in patients with compromised renal function receiving bladder irrigations. Mental status changes, including obtundation, lethargy and confusion, may occur.
Ingestion	Ingestions of small amounts of alum may cause dryness and a puckering sensation of mucous membranes in the mouth and throat. Rectal enemas containing 1% ammonium alum caused mild cramping and nausea in the majority of patients.
Inhalation	Inhalation is irritating and may cause airway congestion. Symptoms are usually transient. Respiratory depression has been reported in patients with severe aluminum encephalopathy.

Skin Concentrated solutions may irritate abraded skin.

Eyes Can cause irritation.

First aid

Ingestion Dilution: immediately dilute with 4 to 8 ounces (120 to 240 ml) of milk or water (not to exceed 4 ounces/120 ml in a child). Do not induce vomiting.

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 and wash exposed area thoroughly with soap and water. A physician should examine the area if irritation or pain persists.

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.

Material Safety Data Sheet

Ammonium chloride

ACC# 01170

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium chloride

Catalog Numbers: AC123340000, AC123340010, AC123340250, AC199970000, AC199970010, AC199975000, AC393180000, AC393180010, AC393180050, AC393182500, AC423280000, AC423280010, AC423285000, A649-3, A649-500, A661-10, A661-3, A661-500, A687-10, A687-100, A687-212, A687-500

Synonyms: Ammonium Chloratum; Ammonium Chloridum; Ammonium Muriate; Sal Ammonia; Salmiac.

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
12125-02-9	Ammonium chloride	>99	235-186-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless or white crystalline powder.

Warning! Harmful if swallowed. Causes eye irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: Gastrointestinal system, eyes.

Potential Health Effects

Eye: Causes 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 systemic toxicity with acidosis.

Inhalation: If heated, dust or fume may cause respiratory tract irritation. May be harmful if inhaled. Ammonium chloride fume may cause an asthma-like allergy. Future exposure may cause asthma attacks with shortness of breath, wheezing, coughing, and/or chest tightness.

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. 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. 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: 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 chloride	10 mg/m ³ TWA (fume); 20 mg/m ³ STEL (fume)	10 mg/m ³ TWA (fume)	none listed

OSHA Vacated PELs: Ammonium chloride: 10 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: Crystalline powder

Appearance: colorless or white

Odor: odorless

pH: 5.0 (10% sol at 25C)

Vapor Pressure: 1 mm Hg @ 160.4C

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 520 deg C

Freezing/Melting Point:328 deg C
Decomposition Temperature:Not available.
Solubility: 39.6% at 176F.
Specific Gravity/Density:1.53 (Water=1)
Molecular Formula:NH₄Cl
Molecular Weight:53.49

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Incompatible materials, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Acids, bases, silver salts, bromine trifluoride, nitrates, potassium chlorates, carbonates, bromine pentafluoride, lead salts.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, ammonia and hydrochloric acid fumes.
Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 12125-02-9: BP4550000; BP4570000

LD50/LC50:

CAS# 12125-02-9:

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, eye: 100 mg Severe;

Oral, mouse: LD50 = 1300 mg/kg;

Oral, rat: LD50 = 1650 mg/kg;

Carcinogenicity:

CAS# 12125-02-9: 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

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# 12125-02-9 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# 12125-02-9: 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 # 12125-02-9: 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:

CAS# 12125-02-9 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# 12125-02-9 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

Risk Phrases:

R 22 Harmful if swallowed.

R 36 Irritating to eyes.

Safety Phrases:

S 22 Do not breathe dust.

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 12125-02-9: 1

Canada - DSL/NDSL

CAS# 12125-02-9 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# 12125-02-9 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 ((nh4)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 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 TPQ.

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

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

L-Ascorbic acid

ACC# 12385

Section 1 - Chemical Product and Company Identification

MSDS Name: L-Ascorbic acid

Catalog Numbers: S71917, S71918, S93131, A61-100, A61-100LC, A61-25, A61-25LC, A62-12, A62-212, A62-25, A62-500, AA245-C, BP351-500

Synonyms: Ascorbic acid; 3-Keto-L-glucofuranolactone; Vitamin C; L-3-keto-threo-hexuronic acid lactone.

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
50-81-7	L-Ascorbic acid	99	200-066-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to yellow crystals.

Caution! Strong reducing agent. Fire and explosion risk in contact with oxidizing agents. May cause eye, skin, and respiratory tract irritation. Light sensitive. Air sensitive.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Low hazard for usual industrial handling. Large doses may cause diarrhea and acidification of the urine

which may cause stones in the urinary tract.

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: 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. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. Powerful reducing agent.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not available.

Autoignition Temperature: 660 deg C (1,220.00 deg F)

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.

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. Use with adequate ventilation. Avoid breathing dust.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. 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
L-Ascorbic acid	none listed	none listed	none listed

OSHA Vacated PELs: L-Ascorbic 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: Crystals

Appearance: white to yellow

Odor: none reported

pH: 2.1-2.6 (5% 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:190 deg C
Solubility: Soluble.
Specific Gravity/Density:1.65
Molecular Formula:C6H8O6
Molecular Weight:176.13

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Stable to air when dry; aqueous solutions are rapidly oxidized by air.

Conditions to Avoid: Light, dust generation, excess heat, moist air.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 50-81-7: CI7650000

LD50/LC50:

CAS# 50-81-7:

Oral, mouse: LD50 = 3367 mg/kg;

Oral, rat: LD50 = 11900 mg/kg;

Coenzyme for a number of hydroxylation reactions; required for collagen synthesis. Inadequate intake results in deficiency syndromes such as scurvy.

Carcinogenicity:

CAS# 50-81-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information found

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# 50-81-7 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# 50-81-7 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# 50-81-7: 0

Canada - DSL/NDSL

CAS# 50-81-7 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

Agar

ACC# 00475

Section 1 - Chemical Product and Company Identification

MSDS Name: Agar

Catalog Numbers: A360-500, B99737, BP1423-2, BP1423-500, BP2466-10, BP2466-100, BP2466-2, BP2466-500, BP2641-1, BP2641-100, BP2641-500, S71613, S71656, S71691-1, S71691-2, S71693-1, S71693-2, S71695-1, S71695-2, S71696-1, S71697-1, S71698-1

Synonyms: Gelose.

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
9002-18-0	Agar	100	232-658-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light beige 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 known.

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.

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 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. 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: 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 skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

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: 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
Agar	none listed	none listed	none listed

OSHA Vacated PELs: Agar: 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: light beige

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:Not available.

Decomposition Temperature:Not available.

Solubility: soluble in hot water

Specific Gravity/Density:Not available.

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: Dust generation, excess heat, strong oxidants.

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# 9002-18-0: AW7950000

LD50/LC50:

CAS# 9002-18-0:

Oral, mouse: LD50 = 16 gm/kg;

Oral, rabbit: LD50 = 5800 mg/kg;

Oral, rat: LD50 = 11 gm/kg;

Carcinogenicity:

CAS# 9002-18-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: 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# 9002-18-0 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.

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# 9002-18-0 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:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 9002-18-0: 0

Canada - DSL/NDSL

CAS# 9002-18-0 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

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

Benzaldehyde

ACC# 02590

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzaldehyde

Catalog Numbers: B240 500, B240-500, B240500

Synonyms: Benzenecarboxaldehyde; artificial almond oil; benzene carbaldehyde; benzoic aldehyde

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
100-52-7	Benzaldehyde	100	202-860-4

Hazard Symbols: XN

Risk Phrases: 22

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow liquid. Flash Point: 64 deg C. **Combustible liquid and vapor.** Harmful if swallowed. Causes digestive and respiratory tract irritation. Causes eye and skin irritation. May cause central nervous system depression. May cause kidney damage. **Warning!**
Target Organs: Kidneys, central nervous system.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Harmful if swallowed. May cause 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.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause respiratory tract irritation. May cause narcotic effects in high concentration.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause kidney injury.

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.

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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back.

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

Flash Point: 64 deg C (147.20 deg F)

Autoignition Temperature: 192 deg C (377.60 deg F)

Explosion Limits, Lower: 1.40%

Upper: 8.5%

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: Avoid runoff into storm sewers and ditches which lead to waterways. 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. Use only in a well-ventilated area. Ground and bond containers when transferring material. 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 and flame. Keep away from sources of ignition. 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 reducing agents. Do not store near alkaline 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
Benzaldehyde	none listed	none listed	none listed

OSHA Vacated PELs: Benzaldehyde: 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. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: yellow

Odor: bitter-almond
pH: 5.9
Vapor Pressure: 1 mm Hg @ 26.2C
Vapor Density: 3.65
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 178 deg C
Freezing/Melting Point:-56 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble.
Specific Gravity/Density:1.0415 @10C
Molecular Formula:C6H5CHO
Molecular Weight:106.0414

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: High temperatures, incompatible materials, ignition sources.
Incompatibilities with Other Materials: Incompatible with strong oxidizing agents. Oxidizes in air to benzoic acid. Reacts dangerously with performic acid.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 100-52-7: CU4375000
LD50/LC50:
CAS# 100-52-7:
Draize test, rabbit, skin: 500 mg/24H Moderate;
Oral, mouse: LD50 = 28 mg/kg;
Oral, mouse: LD50 = 2020 mg/kg;
Oral, rat: LD50 = 1300 mg/kg;
Oral, rat: LD50 = 2400 mg/kg;<BR.

Carcinogenicity:
CAS# 100-52-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No information available.
Teratogenicity: TDLo (Oral, mouse) = 154 gm/kg/2Y-C; Gastrointestinal - tumors
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: Mutation,mammalian somatic cells(Mouse Lymphocyte)=400mg/L.Cytogenetic analysis(Rodent - hamster Lung) = 1 gm/L

Other Studies: Standard Draize Test: Administration onto the skin (rabbit) = 500 mg/24H (Moderate).

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 =11 mg/L; 96 Hr.; UnspecifiedFish: Bluegill/Sunfish: LC50 =1.1-7.6 mg/L; 96 Hr.; UnspecifiedWater flea LC50 =5.0 mg/L; 24 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 =4.85 - 6.11 mg/L; 5, 15, 30 Minutes; Microtox Test, 15 degrees C No data available.

Environmental: Based upon a measured log Kow of 1.48 and a water solubility of 6950 mg/l at 25 deg C, the BCF for benzaldehyde can be estimated to be 7.8 and 4.2, respectively, these BCF values suggest that the biconcentration in aquatic organisms is not important. A number of biological screening studies have demonstrated that benzaldehyde is readily biodegradable. Estimated Koc values of 34 and 150 suggest that benzaldehyde will leach readily.

Physical: Benzaldehyde has a BOD: 50%, 10 days; 150%, 5 days.

Other: Benzaldehyde absorbs UV irradiation weakly (extinction coefficient of 0-30/M-cu cm) in the spectra between 300 and 380 nm.

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.				BENZALDEHYDE
Hazard Class:					9
UN Number:					UN1990
Packing Group:					III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 100-52-7 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.

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 TPQ.

SARA Codes

CAS # 100-52-7: 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:

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# 100-52-7 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, 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:

XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

S 24 Avoid contact with skin.

WGK (Water Danger/Protection)

CAS# 100-52-7: 2

Canada - DSL/NDSL

CAS# 100-52-7 is listed on Canada's DSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

CAS# 100-52-7 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 100-52-7: OEL-HUNGARY:TWA 5 mg/m³;STEL 10 mg/m³ OEL-RUSSIA:STE

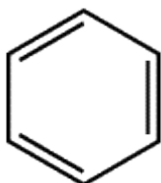
Benzene

- Benzol
- Cyclohexatriene
- Phenyl hydride
- Benzine

Formula

C₆H₆

Structure



Description

Clear, colorless liquid with a characteristic, aromatic hydrocarbon odor. Toxic, volatile, flammable liquid hydrocarbon byproduct of coal distillation.

Uses

Used as an industrial solvent in paints, varnishes, lacquer thinners, gasoline... It was formerly used as parasiticide.

Registry Numbers and Inventories.

CAS	71-43-2
NIH PubChem CID	241
EC (EINECS/ELINCS)	200-753-7
EC Index Number	601-020-00-8
EC Class	F; R11, Carc. Cat. 1; R45, Muta. Cat. 2; R46, T; R48/23/24/25, Xn; R65, Xi; R36/38
RTECS	CY1400000
RTECS class	Agricultural Chemical and Pesticide; Tumorigen; Drug; Mutagen; Reproductive Effector; Human Data; Primary Irritant
UN (DOT)	1114
Merck	13,1066
Beilstein/Gmelin	969212
Beilstein Reference	4-05-00-00583
RCRA	U019
EPA OPP	600019
Swiss Giftliste 1	G-1236
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	C ₆ H ₆
Formula mass	78.11
Melting point, °C	5.5
Boiling point, °C	80.1
Vapor pressure, mm _{Hg}	75 (20 C)
Vapor density (air=1)	2.8
Saturation Concentration	9.9% (98700 ppm) at 20 C; 12.5% (approximately 125300 ppm) at 25 C (calculated)
Evaporization number	3 (diethyl ether = 1)
Odor threshold	4.9 mg/m ³
Critical temperature	288.9
Critical pressure	48.6
Density	0.878 g/cm ³ (20 C)
Solubility in water	1.8 g/L
Viscosity	0.604 cp @ 25C
Surface tension	28.22 g/s ² @ 25 C
Refractive index	1.50108 (20 C)
Dipole moment	2.27 D
Dielectric constant	2.3 (20 C)
Partition coefficient, pK _{ow}	2.13
Heat of fusion	9.9 kJ/mol
Heat of vaporization	33.83 kJ/mol
Heat of combustion	-3275 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. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

[WHMIS](#)

B2 D2A D2B

Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. 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 heat, sparks and flame. 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.
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	Use water spray to dilute spill to a non-flammable mixture. Avoid runoff into storm sewers and ditches which lead to waterways. 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.
Disposal code	9
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Chlorine, oxygen, ozone, permanganates, sulfuric acid, peroxides, perchlorates, nitrating agents, nitric acid, chromic acid anhydride, chromium trioxide, iodine pentafluoride, iodine heptafluoride, dioxygenyl tetrafluoroborate, dioxygen difluoride + hydrogen fluoride, sodium peroxide, uranium hexafluoride, bromine pentafluoride, chlorine trifluoride, nitryl perchlorate, arsenic pentafluoride, potassium methoxide, permanganic acid, peroxodisulfuric acid, liquid oxygen, peroxomonosulfuric acid, metal perchlorates, strong oxidizing agents.
Decomposition	Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Fire.

Flash Point, °C	-11
Autoignition, °C	498
Upper exp. limit, %	7.1
Lower exp. limit, %	1.3

Fire fighting Do not extinguish fire unless flow can be stopped. Use water in flooding quantities as fog. Solid streams of water may spread fire. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. Use foam, dry chemical, or carbon dioxide. Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Fire potential Very flammable. Combustion imminent.

Hazards Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back.

Combustion products Fire will produce irritating, corrosive and/or toxic gases.

NEPA Health 2

Flammability 3

Reactivity 0

Health.

Exposure limit(s)	TLV: 10 ppm; 32 mg/m ³ (as TWA) A2 (ACGIH 1991-1992). OSHA PEL: 1910.1028 TWA 1 ppm ST 5 ppm See Appendix F NIOSH REL: Ca TWA 0.1 ppm ST 1 ppm See Appendix A NIOSH IDLH: Potential occupational carcinogen 500 ppm.
Carcinogen	O, G-A1, I-1, N-1, CP65
Poison_Class	1*
Exposure effects	<p>Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated exposure may cause adverse reproductive effects. May cause bone marrow abnormalities with damage to blood forming tissues. May cause anemia and other blood cell abnormalities. Chronic exposure has been associated with an increased incidence of leukemia and multiple myelomas. Immunodepressive effects have been reported. Animal studies have reported fetotoxicity (growth retardation) and teratogenicity (exencephaly, angulated ribs, dilated brain ventricles).</p>
Ingestion	<p>Aspiration hazard. 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 effects similar to those for inhalation exposure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.</p>
Inhalation	<p>Causes respiratory tract irritation. May cause adverse central nervous system effects including headache, convulsions, and possible death. May cause drowsiness, unconsciousness, and central nervous system depression. Central nervous system effects may include confusion, ataxia, vertigo, tinnitus, weakness, disorientation, lethargy, drowsiness, and finally coma. Exposure may lead to irreversible bone marrow injury. Exposure may lead to aplastic anemia. May be absorbed through the lungs.</p>
Skin	<p>Causes moderate skin irritation. May be absorbed through the skin in harmful amounts. Direct contact with the liquid may cause erythema and vesiculation. Prolonged or repeated contact has been associated with the development of a dry scaly dermatitis or with secondary infections.</p>
Eyes	<p>Causes severe eye irritation. May cause slight transient injury.</p>
First aid	
Ingestion	<p>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. Possible aspiration hazard. Get medical aid immediately.</p>
Inhalation	<p>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.</p>
Skin	<p>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</p>

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.

UN number 1114

Response guide [130](#)

Hazard class 3



Packing Group II

USCG CHRIS Code BNZ

[USCG Compatatibility Group](#) 32 Aromatic hydrocarbons

HS Code 2902 20 00

Std. Transport # 4908112

IMO Chemical Code 17

IMO Pollution Category C

IMO Hazard code S/P

Material Safety Data Sheet

Benzoic acid

ACC# 02720

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzoic acid

Catalog Numbers: AC149130000, AC149130010, AC149135000, AC221800000, AC221800010, AC221802500, AC423470000, AC423470020, AC423470250, AC423475000, A63-500, A65-500, A68-30

Synonyms: Benzenemethanoic acid; Benzenecarboxylic acid; Phenylcarboxylic acid; Phenylformic acid; Carboxybenzene; Benzeneformic acid; Dracylic 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
65-85-0	Benzoic acid	>99	200-618-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if swallowed. May cause sensitization by inhalation and by skin contact.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes severe eye irritation. Causes redness and pain.

Skin: Causes skin irritation. May be harmful if absorbed through the skin. May cause sensitization by skin contact. May be absorbed through the skin in harmful amounts.

Absorption through the skin has produced labored breathing in humans. Benzoic acid can cause redness and swelling with itching (non-immunological contact urticaria or hives) in most people at the site of application. Individuals can react without having been previously exposed to benzoic acid.

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

Inhalation: Causes respiratory tract irritation. May be harmful if inhaled. May cause respiratory sensitization. Intermittent breathing of dust over a 4-week period produced interstitial fibrosis in the lungs of rats. Benzoic acid begins to sublime at 100°C.

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 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.

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. Dusts at sufficient concentrations can form explosive mixtures with air.

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

Flash Point: 121 deg C (249.80 deg F)

Autoignition Temperature: 570 deg C (1,058.00 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.

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: Keep away from sources of ignition. 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
Benzoic acid	none listed	none listed	none listed

OSHA Vacated PELs: Benzoic 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: white

Odor: pleasant odor

pH: 2.8 (satd soln)

Vapor Pressure: 0.0012 mm Hg @ 25 deg C

Vapor Density: 4.21 (air=1)

Evaporation Rate: Negligible.

Viscosity: Not available.
Boiling Point: 249.2 deg C @ 760 mmHg
Freezing/Melting Point:122.4 deg C
Decomposition Temperature:Not available.
Solubility: 3.4 g/l @ 25°C
Specific Gravity/Density:Not available.
Molecular Formula:C7H6O2
Molecular Weight:122.12

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 bases, strong reducing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 65-85-0: DG0875000
LD50/LC50:
CAS# 65-85-0:
Draize test, rabbit, eye: 100 mg Severe;
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, rat: LC50 = >26 mg/m³/1H;
Oral, mouse: LD50 = 1940 mg/kg;
Oral, rat: LD50 = 1700 mg/kg;
Skin, rabbit: LD50 = >10 gm/kg;

Human TDLo skin of 6 mg/kg produced dyspnea (difficult or labored breathing) and allergic dermatitis.

Carcinogenicity:
CAS# 65-85-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Benzoic acid and sodium benzoate have been tested for mutagenicity or genotoxicity in prokaryotes, eukaryotes, and several mammalian test systems. No positive results have been reported. RTECS data for benzoic acid: Mutations in microorganisms: Escherichia coli = 10 mmol/L. DNA inhibition: Human lymphocyte = 5 mmol/L. EPA GENETOX PROGRAM 1988, Negative: Histidine reversion-Ames test; S cerevisiae-homozygosis.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Mosquito Fish: LC50 = 180 mg/L; 96 Hr; Unspecified Bacteria: *Phytobacterium phosphoreum*: EC50 = 16.9 mg/L; 96 Hr; Microtox test @ 15°C If released on land, benzoic acid should leach into the ground due to its low soil adsorption and biodegrade (half-life <1 wk). If released in water, benzoic acid should also readily biodegrade (half-life 0.2-3.6 days). Adsorption to sediment and volatilization should not be significant.

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# 65-85-0 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# 65-85-0: 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 # 65-85-0: 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:

CAS# 65-85-0 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# 65-85-0 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:**

XN

Risk Phrases:

R 22 Harmful if swallowed.

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.

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).

WGK (Water Danger/Protection)

CAS# 65-85-0: 1

Canada - DSL/NDSL

CAS# 65-85-0 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# 65-85-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Benzophenone

ACC# 02740

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzophenone

Catalog Numbers: AC105560000, AC105560010, AC105565000, AC219680000, AC219680500, AC219685000, B270-500, S79917

Synonyms: Diphenylmethanone; Diphenyl ketone

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
119-61-9	Benzophenone	100.0	204-337-6

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: None.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. Animal feeding studies have resulted in liver and bone marrow damage.

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: Animal feeding studies have resulted in liver and bone marrow 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. 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: 143 deg C (289.40 deg F)

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. 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 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
Benzophenone	none listed	none listed	none listed

OSHA Vacated PELs: Benzophenone: 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: rose-like - geranium odor

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 305 deg C

Freezing/Melting Point: 49 deg C

Decomposition Temperature: Not available.

Solubility: insoluble in water.

Specific Gravity/Density: 1.11 (water=1)

Molecular Formula: C₁₃H₁₀O

Molecular Weight: 182.0694

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents and strong reducing agents.

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

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 119-61-9: DI9950000

LD50/LC50:

CAS# 119-61-9:

Oral, mouse: LD50 = 2895 mg/kg;

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

Skin, rabbit: LD50 = 3535 mg/kg;

Carcinogenicity:

CAS# 119-61-9: 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

Ecotoxicity: Fish: Fathead Minnow: LC50 = 15.3 mg/L; 96 Hr.; Unspecified Bacteria: Phytobacterium phosphoreum: EC50 = 8.92 mg/L; 30 minutes; Microtox test No data available.

Environmental: Kocs of 430 and 517 indicate that benzophenone will have low to medium soil mobility category. Leaching in soil should be important; benzophenone has been detected in groundwater samples. One aerobic screening study using sewage inoculum %BODT in 5 days suggests that benzophenone may biodegrade in soil. Biodegradation was observed (no rates given) in soil column studies; Photolysis on soil surfaces will not be

important (half-life of greater than 100 days in water).

Physical: ATMOSPHERIC FATE: Based on an extrapolated vapor pressure of 0.0033 mm Hg at 25 deg C for the super cooled liquid, a vapor pressure of 0.0019 mm Hg at 25 deg C can be estimated for benzophenone after converting to the solid phase. Based on this vapor pressure value, benzophenone should exist almost entirely in the vapor phase in the ambient atmosphere. Vapor phase benzophenone is degraded in the ambient atmosphere by reaction with photochemically formed hydroxyl radicals; the half-life for this reaction in air can be estimated to be about 5.4 days.

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# 119-61-9 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 # 119-61-9: 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# 119-61-9 can be found on the following state right to know lists: Minnesota.

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# 119-61-9: 1

Canada - DSL/NDSL

CAS# 119-61-9 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

Biphenyl

ACC# 15418

Section 1 - Chemical Product and Company Identification

MSDS Name: Biphenyl

Catalog Numbers: AC106250000, AC106250010, AC106252500

Synonyms: Diphenyl.

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
92-52-4	Biphenyl	99	202-163-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: faint yellow crystals.

Warning! Causes eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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. Prolonged exposure to vapor concentrations above 0.005 mg/L is considered

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: 113 deg C (235.40 deg F)

Autoignition Temperature: 540 deg C (1,004.00 deg F)

Explosion Limits, Lower:0.6 vol %

Upper: 5.8 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. 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. 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
Biphenyl	0.2 ppm TWA	0.2 ppm TWA; 1 mg/m ³ TWA 100 mg/m ³ IDLH	0.2 ppm TWA; 1 mg/m ³ TWA

OSHA Vacated PELs: Biphenyl: 0.2 ppm TWA; 1 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: 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 - faint yellow

Odor: pleasant odor - butter-like

pH: Not available.

Vapor Pressure: 9.46 mm Hg @ 115 deg C

Vapor Density: 5.31

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 255 deg C

Freezing/Melting Point: 68.5 - 71 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 0.991

Molecular Formula: C₁₂H₁₀

Molecular Weight: 154.21

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: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 92-52-4: DU8050000

LD50/LC50:

CAS# 92-52-4:

Draize test, rabbit, eye: 100 mg Mild;
Draize test, rabbit, skin: 500 uL/24H Severe;
Oral, mouse: LD50 = 1900 mg/kg;
Oral, rabbit: LD50 = 2400 mg/kg;
Oral, rat: LD50 = 2140 mg/kg;
Skin, rabbit: LD50 = >5010 mg/kg;

Carcinogenicity:

CAS# 92-52-4:

- **ACGIH:** Not listed.
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2A carcinogen

Epidemiology: Oral, mouse: TDLo = 56 gm/kg (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Lungs, Thorax, or Respiration - tumors and Blood - tumors).; Subcutaneous, mouse: TDLo = 46 mg/kg (Tumorigenic - neoplastic by RTECS criteria - Lungs, Thorax, or Respiration - tumors and Liver - tumors).

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Unscheduled DNA Synthesis: Oral, rat = 8400 mg/kg/4W (Continuous).; Mutation in Microorganisms: Mouse, Lymphocyte = 20 umol/L.; DNA Damage: Mouse, Lymphocyte = 50 umol/L.; DNA Damage: Oral, mouse = 2 gm/kg.; Mutation in Mammalian Somatic Cells: Mouse, Lymphocyte = 296 umol/L.; Cytogenetic Analysis: Hamster, Lung = 10 mg/L.; Sister Chromatid Exchange: Hamster, Fibroblast = 100 umol/L.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 1.2-3.3 mg/L; 96 Hr; Flow-through at 10

CWater flea Daphnia: EC50 = 0.63-3.91 mg/L; 48 Hr; (< 24 hrs old) Static at 22.2 C (pH 7.9-8.2)Bacteria: Phytobacterium phosphoreum: EC50 = 1.9-3.3 mg/L; 5,15,30 min; Microtox test at 15C Volatilization from moist soil surfaces will occur, but it is not expected to be significant from dry soil surfaces. Biphenyl readily biodegrades aerobically in both soil and water with an increased rate of biodegradation following acclimation (resistant under anaerobic conditions). Biphenyl will volatilize from water surfaces. Estimated BCF value range = 280-4500. This value range suggests that biphenyl will bioconcentrate in aquatic organisms.

Environmental: Biphenyl will exist in both the vapor phase and the particulate phase in the ambient atmosphere. The biphenyl present in the vapor phase will be degraded by reaction with photochemically-produced hydroxyl radicals with a half-life of 2 days. The particulate phase biphenyl will be removed from the atmosphere by dry deposition.

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:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O (Biphenyl)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O (Biphenyl)
Hazard Class:	9	9
UN Number:	UN3077	UN3077
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 92-52-4 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 92-52-4: Effective 4/29/83, Sunset 4/29/93

Chemical Test Rules

CAS# 92-52-4: 40 CFR 799.5115

Section 12b

CAS# 92-52-4: Section 4, 0.1 % de minimus concentration

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

CAS# 92-52-4: 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 # 92-52-4: immediate, delayed.

Section 313

This material contains Biphenyl (CAS# 92-52-4, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 92-52-4 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:

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# 92-52-4 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 N

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

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

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

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# 92-52-4: 2

Canada - DSL/NDSL

CAS# 92-52-4 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# 92-52-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

2-Naphthol, 98%

ACC# 97239

Section 1 - Chemical Product and Company Identification

MSDS Name: 2-Naphthol, 98%

Catalog Numbers: AC156970000, AC156970010, AC156970025

Synonyms: 2-Hydroxynaphthalene; 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
135-19-3	2-NAPHTHOL	98	205-182-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slightly brown solid.

Danger! Highly toxic. May be fatal if inhaled. Causes eye, skin, and respiratory tract irritation. May be harmful if swallowed. Aspiration hazard if swallowed. Can enter lungs and cause damage. Light sensitive.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

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

Inhalation: May be fatal if inhaled. Causes respiratory tract irritation.

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

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. 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 water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 400 deg C (752.00 deg F)

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: 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. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from heat and flame. Keep away from sources of ignition. Do not store in direct sunlight. Keep container closed when not in use. 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. Material darkens in color during storage.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2-NAPHTHOL	none listed	none listed	none listed

OSHA Vacated PELs: 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: Solid

Appearance: slightly brown

Odor: Slight phenolic

pH: Not available.

Vapor Pressure: 10 mm Hg @145.5

Vapor Density: 4.97 (air=1)

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 285 - 286 deg C @ 760.00mm Hg

Freezing/Melting Point:122 - 123 deg C

Decomposition Temperature:400 deg C

Solubility: 1 G/L WATER (20°C)

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.

Conditions to Avoid: Incompatible materials, light.

Incompatibilities with Other Materials: Strong oxidizing agents - strong bases - acid chlorides - acid anhydrides - concentrated sulfuric and nitric acids - antipyrine - camphor - phenol - ferric salts - menthol - urethane - potassium permanganate.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, toxic fumes of sodium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 135-19-3: QL2975000

LD50/LC50:

CAS# 135-19-3:

Draize test, rabbit, eye: 100 mg Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = >770 mg/m³/1H;

Oral, mouse: LD50 = 98 mg/kg;

Oral, rabbit: LD50 = 5400 mg/kg;

Oral, rat: LD50 = 1960 mg/kg;

Oral, rat: LD50 = 1980 mg/kg;

Skin, rabbit: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 135-19-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: Mutation data has been reported.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Fish toxicity:LC50 fathead minnow 3.5 mg/L/96HLC50 rainbow trout 0.12 mg/L/27day Invertebrate toxicity:LC50 Daphnia magna 3.5

mg/L/48HEC50 Selenastrum capricornutum 19 mg/L/4HEC50 Photobacterium phosphoreum 0.275 ppm/5-30 min Microtox test (The Dictionary of Substances and their Effects, 1992).

Environmental: Degradation studies:Biodegradable (The Dictionary of Substances and their Effects, 1992).

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.	No information available.
Hazard Class:	6.1	
UN Number:	UN2811	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 135-19-3 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 # 135-19-3: 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# 135-19-3 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 20/22 Harmful by inhalation and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 135-19-3: 2

Canada - DSL/NDSL

CAS# 135-19-3 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# 135-19-3 is listed on the Canadian Ingredient Disclosure List.

J M TULL METALS CO INC -- BRASS ALLOYS HALF HARD -- 9510-00N036465

=====
===== Product Identification =====

Product ID:BRASS ALLOYS HALF HARD
MSDS Date:11/25/1985
FSC:9510
NIIN:00N036465
MSDS Number: BQPTG
=== Responsible Party ===
Company Name:J M TULL METALS CO INC
Address:4400 PEACHTREE INDUSTRIAL BLVD
Box:4725
City:NORCROSS
State:GA
ZIP:30091
Country:US
Info Phone Num:404-449-1611
Emergency Phone Num:404-449-1611
CAGE:0B5P5
=== Contractor Identification ===
Company Name:J M TULL METALS CO INC
Address:4400 PEACHTREE INDUSTRIAL BLVD
Box:City:NORCROSS
State:GA
ZIP:30091
Country:US
Phone:404-449-1611
CAGE:0B5P5

=====
===== Composition/Information on Ingredients =====

Ingred Name:ING 8:EARLY EFTS ARE CHARACT BY FATG, CONSTIP, MUSCLE
ACHES, ABDOM PAINS & DECR APPETITE. LATER SIGNS & SYMPS (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9:CAN INCL ANEMIA, PALLOR, "LEAD LINE" ON GUMS &
REDUCED HAND-GRIP STRENGTH. LEAD COLIC PRDCES INTENSE ABDOM(ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10:CRAMPING WHICH CAN BE ACCOMPANIED BY CONSTIP, NAUS &
VOMIT. CNDTN CALLED "WRIST DROP" CAN DEVEL IF (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11:PERIPHERAL NERV SYS IS AFFECTED. SEV CNS EFTS
(REFERRED TO AS LEAD ENCEPHALOPATHY) USUALLY ONLY OCCUR (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 12:AFTER HVY & RAPID LEAD EXPOS. SIGNS & SYMPS MAY INCL
HDCH, DIZZ, CONVLS, DELIRIUM, COMA & POSS DEATH. (ING 14)
RTECS #:9999999ZZ

Ingred Name:ING 13:LONG-TERM LEAD EXPOS CAN ALSO PRDCE KIDNEY DMG
W/POSS DECR RENAL FUNC LEADING TO SUCH CNDTNS AS UREMIA. (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14:TIN:TOX OF INORG TIN CMPDS IS GEN LOW. EXPOS TO

DUST/FUMES OF TIN OXIDES CAN RSLT IN BENIGN (ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15:PNEUMOCONIOSIS CALLED STANNOSIS. NO TISS RXN/PULM
DYSFUNCTION HAS BEEN ASSOC W/THIS LUNG CNDTN.
RTECS #:9999999ZZ

Ingred Name:COPPER (CU) (SARA III) (BASE METAL)
CAS:7440-50-8
RTECS #:GL5325000
Fraction by Wt: 55-90%
OSHA PEL:0.1MG/M3 FUME;1 DUST
ACGIH TLV:0.2MG/M3 FUME;1 DUST
EPA Rpt Qty:5000 LBS
DOT Rpt Qty:5000 LBS

Ingred Name:INGREDIENTS 3 - 5 ARE ALLOYING ELEMENTS.
RTECS #:9999999ZZ

Ingred Name:ZINC (ZN) (SARA III). PEL/TLV AS ZINC OXIDE.
CAS:7440-66-6
RTECS #:ZG8600000
Fraction by Wt: 45%
OSHA PEL:10MG/M3 TDUST;5 FUME
ACGIH TLV:10MG/M3 TDUST;5 FUME
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:LEAD (PB) (SARA III)
CAS:7439-92-1
RTECS #:OF7525000
Fraction by Wt: 3.7%
OSHA PEL:0.05 MG/M3
ACGIH TLV:0.15 MG/M3 DUST
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

Ingred Name:TIN (SN)
CAS:7440-31-5
RTECS #:XP7320000
Fraction by Wt: 1%
OSHA PEL:2 MG/M3
ACGIH TLV:2 MG/M3

Ingred Name:SUPDAT:FEVER, CHILLS, MUSCLE ACHES, NAUS, VOMIT, WEAK, FATG
& PROFUSE SWEAT. ATTACK MAY LAST 6-48 HRS & IS MORE (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:LIKELY TO OCCUR AFTER PERIOD AWAY FROM JOB.
LEAD:CHRONIC/ACUTE INHAL EXPOS TO FUMES/DUST OF INORG LEAD (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7:CMPDS (SUCH AS LEAD OXIDE) CAN ADVERSELY AFFECT
SEVERAL ORG SYS INCL NERV, GI, HEMATOLOGICAL & RENAL SYS. (ING 9)
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:NOTE:LEAD (7439-92-1) APPEARS ON NAVY LIST OF OCCUP CHEMICAL REPRO HAZS. CONSULT APPROP HLTH PROFESSIONAL CONCERNING LATEST HAZ LIST INFO & SAFE HNDLG & EXPOS RECOMS .
COPPER(CU):INHAL OF CU FUM ES MAY CAUSE IRRIT OF EYES, NOSE & THROAT & FLU-LIKE ILLNESS CALLED METAL FUME FEVER. SIGNS & SYMPS OF (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:METAL FUME FEVER INCL FEVER, MUSCLE ACHES, NAUS, CHILLS, DRY THROAT, COUGH & WEAK. CU FUMES MAY ALSO PRDCE METALLIC/SWEET TASTE. RPTD/PRLNG EXPOS TO CU FUMES MAY CAUSE DISCOLORATION OF SKIN & HAIR. ZINC:SUBJECTING ZINC/ALLOYS CNTNG ZINC TO HIGH TEMPS (SUCH AS OCCURS DURING WELDING) WILL CAUSE FORM OF (SUPDAT)
Medical Cond Aggravated by Exposure:CHRONIC DISEASES OR DISORDERS OF THE RESPIRATORY SYSTEM.

=====
First Aid Measures
=====

First Aid:INGEST:CALL MD IMMEDIATELY . INHAL:REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O*2/ARTF RESP) . EYES:IMMEDIATELY FLUSH W/POTABLE WATER FOR A MINIMUM OF 15 MINUTES, SEEK ASSISTANCE FROM MD . SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD .

=====
Fire Fighting Measures
=====

Extinguishing Media:MEDIA SUITABLE FOR SURROUNDING FIRE .
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:BRASS PRODS IN SOLID STATE PRESENT NO FIRE/EXPLO HAZ. DUST HAZS EXIST UNDER FAVORING CNDTNS OF SM PRACT SIZE. DISPERSION IN AIR & STRONG IGNIT SOURCE (SUPDAT)

=====
Accidental Release Measures
=====

Spill Release Procedures:NONE SPECIFIED BY MANUFACTURER.
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:NIOSH/MSHA APPROVED DUST & FUME RESPIRATOR SHOULD BE USED TO AVOID EXCESSIVE INHALATION OF PARTICULATES WHEN EXPOSURE EXCEEDS TLV'S.
Ventilation:ADEQUATE VENT SHOULD BE UTILIZED WHEN WELDING, BURNING, SAWING, BRAZING, GRINDING OR MACHINING WHEN EXPOS EXCEEDS TLV'S.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:OTHER PROTECTIVE EQUIPMENT SHOULD BE UTILIZED AS REQUIRED BY WELDING STANDARDS.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

EXPLO HAZ:MAY RSLT IN EXPLO. HAZ DECOMP PROD:MATLS ARE INVOLVED. EFT OF
OVEREXP:ZINC OXIDE. EXPOS TO ZINC OXIDE FUMES/DUSTS CAN RSLT IN
FLU-LIKE ILLNESS CALLED METAL FUME FEVER. EARLY SYMPS MAY INCL S
WEET/METALLIC TASTE IN MOUTH, DRYNESS & IRRIT OF THROAT & COUGH.
SYMPS MAY PROGRESS TO SHORTNESS OF BREATH, HDCH, (ING 6)

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:>1590F,>866

Spec Gravity:7.7-8.9(H*20=1)

Appearance and Odor:REDDISH-BROWN METAL; NO ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

INCOMPAT W/MERCURY, AMMONIA, ACETYLENE. AVOID EXPOS DURING STOR TO
STRONG ACIDS, BASES/OXIDIZING AGENTS.

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:TOX GASES, AEROSOLS & VAPS MAY BE RELS
IN FIRE INVOLVING COPPER ALLOYS IF FUME OF OTHER CMPDS/OTHER
CONTACTING (SUPDAT)

===== Disposal Considerations =====

Waste Disposal Methods:USED OR UNUSED PRODUCT SHOULD BE TESTED TO
DETERMINE HAZARD STATUS & DISPOSAL REQUIREMENTS UNDER FEDERAL,
STATE OR LOCAL LAWS & 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

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: Bromthymol 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 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# 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

n-Butyl acetate

ACC# 15380

Section 1 - Chemical Product and Company Identification

MSDS Name: n-Butyl acetate

Catalog Numbers: AC107750000, AC107750010, AC107750025, AC167680000, AC167680010, AC167680040, AC167685000, AC327850000, AC327850010, B395-4, B396-1, B396-4, B396-4LC, B3961LC, B396FB115, B396FB19, B396FB200, B396FB50, B396POP19, B396POP200, B396POP50, B396POPB200, B396POPB50, B396RB200, B396RB50, B396RS200, B396RS50, B396SS115, B396SS19, B396SS200, B396SS28, B396SS50, BP1135-500, NC9461437

Synonyms: Acetic acid, butyl ester; Butyl acetate; 1-Butyl acetate; Butyl ethanoate.

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
123-86-4	n-Butyl acetate	>98	204-658-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 22 deg C.

Warning! Flammable liquid and vapor. Breathing vapors may cause drowsiness and dizziness. Causes eye and respiratory tract irritation. Repeated exposure may cause skin dryness or cracking.

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

Potential Health Effects

Eye: Causes eye irritation. Vapors cause eye irritation.

Skin: Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. Not expected to cause an allergic skin reaction. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Fifty subjects underwent repeated insult patch-testing with n-butyl acetate. Patches containing 0.5 ml of butyl acetate were applied for nine 24-hour applications over a 3-week period; challenge patches were applied 10 to 14 days after the final induction application. No subject was sensitized.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts may cause CNS depression.

Inhalation: Causes respiratory tract irritation. Inhalation of vapors may cause drowsiness and dizziness.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis.

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. Vapors may form an explosive mixture with air. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Liquid will float and may reignite on the surface of water. Flammable liquid and vapor. May accumulate static electrical charges, and may cause ignition of its own vapors. 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: 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. Water may be ineffective.

Flash Point: 22 deg C (71.60 deg F)

Autoignition Temperature: 407 deg C (764.60 deg F)

Explosion Limits, Lower:1.3

Upper: 7.6

NFPA Rating: (estimated) Health: 2; Flammability: 3; 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. Use water spray to disperse the gas/vapor. 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. 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 container tightly closed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid breathing vapor.

Storage: Keep away from sources of ignition. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-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
n-Butyl acetate	150 ppm TWA; 200 ppm STEL	150 ppm TWA; 710 mg/m ³ TWA 1700 ppm IDLH	150 ppm TWA; 710 mg/m ³ TWA

OSHA Vacated PELs: n-Butyl acetate: 150 ppm TWA; 710 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

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: Liquid

Appearance: clear, colorless

Odor: ester-like - sweet, fruity odor

pH: Not available.

Vapor Pressure: 11.5 mm Hg @ 25 deg C

Vapor Density: 4.0 (air=1)

Evaporation Rate:5.8 (CCl4=1)

Viscosity: 0.73 cps @ 20 deg C

Boiling Point: 125 - 126 deg C

Freezing/Melting Point:-77 deg C

Decomposition Temperature:Not available.

Solubility: Slightly soluble.

Specific Gravity/Density:0.8800 @ 20°C

Molecular Formula:C6H12O2

Molecular Weight:116.16

Section 10 - Stability and Reactivity

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

Conditions to Avoid: Ignition sources, excess heat, confined spaces.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, nitrates, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), potassium tert-butoxide, Reacts w/H2O on standing to form acetic acid & n-butyl alcohol. This is a very slow reaction..

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 123-86-4: AF7350000

LD50/LC50:

CAS# 123-86-4:

Draize test, rabbit, eye: 100 mg Moderate;

Draize test, rabbit, skin: 500 mg/24H Moderate;
Inhalation, mouse: LC50 = 6 gm/m³/2H;
Inhalation, rat: LC50 = 390 ppm/4H;
Oral, mouse: LD50 = 6 gm/kg;
Oral, rabbit: LD50 = 3200 mg/kg;
Oral, rat: LD50 = 10768 mg/kg;
Skin, rabbit: LD50 = >17600 mg/kg;

Carcinogenicity:

CAS# 123-86-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: Exposure to n-butyl acetate vapors throughout gestation did not cause significant teratogenicity in rabbits, rats, or mice.

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 18.0 mg/L; 96 Hr.; Unspecified Fish: Bluegill/Sunfish: LC50 = 100.0 mg/L; 96 Hr.; Static condition Water flea EC50 = 44.0 mg/L; 48 Hr.; 23 degrees C Algae: LC50 = 320.0 mg/L; 96 Hr.; Unspecified Bacteria: Phytobacterium phosphoreum: EC50 = 3100.0-130 mg/L; 5, 15 minutes; Microtox test, 15 degrees C Daphnia: Daphnia: 44-205 mg/l; 96 H; LC50 No data available.

Environmental: Based on estimated Koc values of 34 and 233, n-butyl acetate may be subject to moderate-to-high leaching. Volatilization from dry soil surfaces is likely to be rapid. n-Butyl acetate may be susceptible to significant biodegradation in natural water.

Physical: n-Butyl acetate will exist almost entirely in the vapor-phase in the ambient atmosphere due to its relatively high vapor pressure. The half-life for the vapor-phase reaction of n-butyl acetate with photochemically produced hydroxyl radicals has been estimated to be about 6 days in an average atmosphere indicating that this reaction will be the dominant removal mechanism.

Other: ThOD: 2.207 g oxygen/g BOD-5: 1.020 g oxygen/g BOD-20: 1.45 g oxygen/g

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:	BUTYL ACETATES	BUTYL ACETATES
Hazard Class:	3	3
UN Number:	UN1123	UN1123
Packing Group:	II	II
Additional Info:		FLASHPOINT 22 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 123-86-4 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

CAS# 123-86-4: 40 CFR 799.5000

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# 123-86-4: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 123-86-4: 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:

CAS# 123-86-4 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# 123-86-4 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:

R 10 Flammable.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 123-86-4: 1

Canada - DSL/NDSL

CAS# 123-86-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, 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# 123-86-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cadmium Sulfate Anhydrous

ACC# 03800

Section 1 - Chemical Product and Company Identification

MSDS Name: Cadmium Sulfate Anhydrous

Catalog Numbers: C23-100, C23-500

Synonyms: Sulfuric acid cadmium 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
10124-36-4	Cadmium Sulfate	100	233-331-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! Toxic. Cancer hazard. Harmful if swallowed. Causes eye and skin irritation. Contains cadmium. Avoid creating dust. Causes digestive and respiratory tract irritation. May cause blood abnormalities. May cause lung damage. May cause liver and kidney damage.

Target Organs: Kidneys, liver, lungs, skeletal structures.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

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

Inhalation: Effects may be delayed. Causes respiratory tract irritation. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause dyspnea (difficult or labored breathing). Damage may be delayed. May cause anemia. May cause cough, chest pain, fever, muscular cramps, and headache.

Chronic: May cause respiratory tract cancer. Prolonged or repeated exposure may cause permanent bone structure abnormalities. May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Chronic inhalation may cause pulmonary emphysema.

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: 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 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. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

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: 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 hands before eating. Use with adequate ventilation. Avoid contact with skin and eyes. 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: 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
Cadmium Sulfate	0.01 mg/m ³ TWA (as Cd); 0.002 mg/m ³ TWA (respirable fraction, as Cd) (listed under Cadmium compounds).	none listed	2.5 æg/m ³ Action Level (as Cd); 5 æg/m ³ PEL (as Cd. Do not eat, drink or chew tobacco or gum or apply cosmetics in regulated areas. Carcinogen: dust can cause lung and kidney disease. See 29 CFR 1910.1027) (listed under Cadmium compounds).

OSHA Vacated PELs: Cadmium 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 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: 3.5-6 (5% solution).
Vapor Pressure: Negligible.
Vapor Density: 7.2
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not applicable.
Freezing/Melting Point: 1832 deg F
Decomposition Temperature: Not available.
Solubility: 76% @ 0C in water.
Specific Gravity/Density: 4.69
Molecular Formula: CdSO₄
Molecular Weight: 208.4676

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, excess heat.
Incompatibilities with Other Materials: Violently reacts with magnesium and with aluminum powder when heated.
Hazardous Decomposition Products: Oxides of sulfur, irritating and toxic fumes and gases, toxic cadmium oxide fumes.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10124-36-4: EV2700000
LD50/LC50:
CAS# 10124-36-4:
Oral, mouse: LD50 = 47 mg/kg;
Oral, rat: LD50 = 280 mg/kg;

Carcinogenicity:
CAS# 10124-36-4:

- **ACGIH:** A2 - Suspected Human Carcinogen (listed as 'Cadmium compounds').
- **California:** carcinogen, initial date 10/1/87 (listed as Cadmium compounds).
- **NTP:** Known carcinogen (listed as Cadmium compounds).
- **IARC:** Group 1 carcinogen (listed as Cadmium compounds).

Epidemiology: NIOSH cited recent epidemiological evidence of a significant excess of respiratory cancer deaths among a cohort of cadmium production workers, and concluded that cadmium and its compounds are potential carcinogens.

Teratogenicity: Experimental teratogenic effects have been reported.

Reproductive Effects: Experimental reproductive effects have been reported.

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:	CADMIUM COMPOUNDS	No information available.
Hazard Class:	6.1	
UN Number:	UN2570	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10124-36-4 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 # 10124-36-4: immediate, delayed.

Section 313

This material contains Cadmium Sulfate (listed as Cadmium compounds), 100%, (CAS# 10124-36-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 10124-36-4 (listed as Cadmium 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# 10124-36-4 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# 10124-36-4 can be found on the following state right to know lists: California, (listed as Cadmium compounds), New Jersey, Pennsylvania, Minnesota, (listed as Cadmium 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 Cadmium Sulfate, listed as 'Cadmium 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 22 Harmful if swallowed.

R 49 May cause cancer by inhalation.

R 48/23/25 Toxic : danger of serious damage to health by prolonged exposure through inhalation 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.

WGK (Water Danger/Protection)

CAS# 10124-36-4: 3

Canada - DSL/NDSL

CAS# 10124-36-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of 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# 10124-36-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cadmium nitrate tetrahydrate

ACC# 03780

Section 1 - Chemical Product and Company Identification

MSDS Name: Cadmium nitrate tetrahydrate

Catalog Numbers: AC212340000, AC212342500, AC315060000, AC315061000, AC315065000, AC403750000, AC403755000, C13-100, C13-500

Synonyms: Cadmium dinitrate 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
10022-68-1	Cadmium nitrate tetrahydrate	98+	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Harmful if swallowed, inhaled, or absorbed through the skin. Cancer hazard. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Causes eye and skin irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, skeletal structures, eyes, skin.

Potential Health Effects

Eye: Causes mild eye irritation.

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

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

Inhalation: Harmful if inhaled. May cause respiratory tract irritation.

Chronic: Prolonged or repeated exposure may cause permanent bone structure abnormalities. May cause cancer in humans. Chronic inhalation may cause pulmonary emphysema.

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. Strong oxidizer. Contact with other material may cause fire.

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: 3; 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. 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
Cadmium nitrate tetrahydrate	0.01 mg/m ³ TWA (as Cd); 0.002 mg/m ³ TWA (respirable fraction, as Cd) (listed under Cadmium compounds).	9 mg/m ³ IDLH (dust and fume, as Cd) (listed under Cadmium compounds).	2.5 æg/m ³ Action Level (as Cd); 5 æg/m ³ TWA (as Cd, Do not eat, drink or chew to baccho or gum or apply cosmetics in regulated areas. Carcinogen - dust can cause lung and kidney disease. See 29 CFR 1 910.1027) (listed under Cadmium compounds).
Cadmium nitrate anhydrous	0.01 mg/m ³ TWA (as Cd); 0.002 mg/m ³ TWA (respirable fraction, as Cd) (listed under Cadmium compounds).	9 mg/m ³ IDLH (dust and fume, as Cd) (listed under Cadmium compounds).	2.5 æg/m ³ Action Level (as Cd); 5 æg/m ³ TWA (as Cd, Do not eat, drink or chew to baccho or gum or apply cosmetics in regulated areas. Carcinogen - dust can cause lung and kidney disease. See 29 CFR 1 910.1027) (listed under Cadmium compounds).

OSHA Vacated PELs: Cadmium nitrate tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Cadmium 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 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: 3.9 (50g/L aq. sol.)
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 132 deg C @ 760 mmHg
Freezing/Melting Point: 59 deg C
Decomposition Temperature: Not available.
Solubility: 2150 g/L (20°C)
Specific Gravity/Density: 2.455 @ 17C
Molecular Formula: Cd(NO₃)₂·4H₂O
Molecular Weight: 308.46

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: Reducing agents, copper, copper alloys, phosphorus, organic materials.
Hazardous Decomposition Products: Nitrogen oxides.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10022-68-1: EV1850000
CAS# 10325-94-7: EV1750000
LD50/LC50:
CAS# 10022-68-1:

Draize test, rabbit, eye: 20 mg/24H Moderate;
Draize test, rabbit, skin: 500 mg/24H Severe;
Oral, rat: LD50 = 300 mg/kg;

CAS# 10325-94-7:

Oral, mouse: LD50 = 47 mg/kg;
Oral, rat: LD50 = 300 mg/kg;

Carcinogenicity:

CAS# 10022-68-1:

- **ACGIH:** A2 - Suspected Human Carcinogen (listed as 'Cadmium compounds').
- **California:** carcinogen, initial date 10/1/87 (listed as Cadmium compounds).
- **NTP:** Known carcinogen (listed as Cadmium compounds).
- **IARC:** Group 1 carcinogen (listed as Cadmium compounds).

CAS# 10325-94-7:

- **ACGIH:** A2 - Suspected Human Carcinogen (listed as 'Cadmium compounds').
- **California:** carcinogen, initial date 10/1/87 (listed as Cadmium compounds).
- **NTP:** Known carcinogen (listed as Cadmium compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: IARC Group 1: Proven human carcinogenic substance. See actual RTECS.

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: Rainbow trout: 55ug/L; 48H; Fish: Fathead Minnow: 820ug/L; 48H; No data available.

Environmental: Terrestrial: May migrate in the environment in the form of nitrate, chloride, carbonate complexes, hydroxide complexes, ammonia complexes, and as chelated and other organo-metallic complexes resulting from decay of plant and animal matter.

Aquatic: Relatively mobile and may be transported in solution as either hydrated cations or as organic or inorganic complexes. Not expected to biodegrade but will bioconcentrate.

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:	NITRATES, INORGANIC, N.O.S.	NITRATES, INORGANIC NOS
Hazard Class:	5.1	5.1
UN Number:	UN1477	UN1477
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10022-68-1 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# 10325-94-7 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

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10022-68-1: immediate, delayed, fire.

CAS # 10325-94-7: immediate, delayed, fire.

Section 313

This material contains Cadmium nitrate tetrahydrate (listed as Cadmium compounds),

98+%, (CAS# 10022-68-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Cadmium nitrate anhydrous (listed as Cadmium compounds), -%, (CAS# 10325-94-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 10022-68-1 (listed as Cadmium compounds) is listed as a hazardous air pollutant (HAP).

CAS# 10325-94-7 (listed as Cadmium 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# 10022-68-1 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 10325-94-7 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# 10022-68-1 can be found on the following state right to know lists: California, (listed as Cadmium compounds), New Jersey, (listed as Cadmium compounds), New Jersey, (listed as Cadmium inorganic compounds), Pennsylvania, (listed as Cadmium compounds), Minnesota, (listed as Cadmium compounds).

CAS# 10325-94-7 can be found on the following state right to know lists: California, (listed as Cadmium compounds), New Jersey, (listed as Cadmium compounds), Pennsylvania, (listed as Cadmium compounds), Minnesota, (listed as Cadmium 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 Cadmium nitrate tetrahydrate, listed as 'Cadmium compounds', a chemical known to the state of California to cause cancer. WARNING: This product contains Cadmium nitrate anhydrous, listed as 'Cadmium 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 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 45 May cause cancer.

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 17 Keep away from combustible material.

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 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# 10022-68-1: No information available.
CAS# 10325-94-7: 3

Canada - DSL/NDSL

CAS# 10325-94-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, 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# 10022-68-1 is not listed on the Canadian Ingredient Disclosure List.
CAS# 10325-94-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Caffeine, 98% (Titr.)

ACC# 00347

Section 1 - Chemical Product and Company Identification

MSDS Name: Caffeine, 98% (Titr.)

Catalog Numbers: AC403770000, AC403771000, AC403775000

Synonyms: 3,7-Dihydro-1,3,7-Trimethyl-1H-Purine-2,6-Dione; Xanthrine,1,3,7-Trimethyl; Anhydrous Caffeine; Methyl Theobromide

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
58-08-2	CAFFEINE	98	200-362-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Harmful if swallowed. May cause eye and skin irritation. May cause respiratory tract irritation. May cause digestive tract irritation with nausea, vomiting, and diarrhea. May cause cardiac disturbances. May cause adverse reproductive effects. May cause central nervous system effects.

Target Organs: Heart, central nervous system.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion increases the metabolic rate causing warm, flushed and moist skin, muscular weakness, rapid heart rate, insomnia, nervousness, increased metabolism and weight loss. May cause ataxia, blood pressure elevation, convulsions, hallucinations, hypermotility, muscle contraction or spasticity, somnolence (general

depressed activity), toxic psychosis, and tremors.

Inhalation: May cause respiratory tract irritation. May cause effects similar to those described for ingestion.

Chronic: May cause digestive tract and cardiac disturbances. May cause reproductive and fetal 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: 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: 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: 540 deg C (1,004.00 deg F)

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: Provide ventilation. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Do not ingest or inhale. 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: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Exposure Limits

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

OSHA Vacated PELs: CAFFEINE: 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: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 177.8 deg C

Freezing/Melting Point:237.8 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble in water.
Specific Gravity/Density:1.23
Molecular Formula:C8H10N4O2
Molecular Weight:194.0956

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: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 58-08-2: EV6475000

LD50/LC50:

CAS# 58-08-2:

Oral, mouse: LD50 = 127 mg/kg;

Oral, rabbit: LD50 = 224 mg/kg;

Oral, rat: LD50 = 192 mg/kg;

Carcinogenicity:

CAS# 58-08-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Experimental reproductive effects have been reported.

Teratogenicity: A human teratogen, causes developmental abnormalities of the craniofacial and musculoskeletal systems, pregnancy termination and stillbirth.

Reproductive Effects: See above.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: TERRESTRIAL FATE: If released to soil, estimated soil adsorption indicate that caffeine will display very high mobility. An estimated Henry's Law constant of 1.9×10^{-19} atm-cu m/mole at 25 deg C indicates that it will not volatilize from moist soil to the atmosphere. AQUATIC FATE: If released to water caffeine will not bioconcentrate aquatic organisms. ATMOSPHERIC FATE: Exists predominantly in the particulate phase, half life 2.5 hours. Expected to biodegrade but not 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:	ALKALOIDS, SOLID, N.O.S.	No information available.
Hazard Class:	6.1	
UN Number:	UN1544	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 58-08-2 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 # 58-08-2: 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# 58-08-2 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# 58-08-2: 1

Canada - DSL/NDSL

CAS# 58-08-2 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

Section 16 - Additional Information

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.

FISHER SCIENTIFIC CHEMICAL DIV -- S79946-1 CALCIUM NITRATE
TETRAHYDRATE -- 6810-00F051312

=====
Product Identification
=====

Product ID:S79946-1 CALCIUM NITRATE TETRAHYDRATE
MSDS Date:03/04/1996
FSC:6810
NIIN:00F051312
MSDS Number: CCGXX
=== 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:CALCIUM NITRATE TETRAHYDRATE
CAS:13477-34-4
RTECS #:EW3000000
Fraction by Wt: >99%

=====
Hazards Identification
=====

LD50 LC50 Mixture:ORAL LD50(RAT): 3900 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: MAY CAUSE IRRITATION.
INGESTION: CAUSES GASTROINTESTINAL IRRITATION. INHALATION:
RESPIRATORY TRACT IRRITATION. MAY CAUSE METHEMOGLOBINEMIA,
CYANOSIS, TACHYCARDIA, DYSPNEA & DEATH.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION, NAUSEA, VOMITING, DIARRHEA,
CONVULSIONS

=====
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: INDUCE VOMITING.
IF CONSCIOUS & ALERT, GIVE 2-4 CUPFULS OF MILK/WATER. INHALATION:
REMOVE TO FRE SH AIR IMMEDIATELY. OBTAIN MEDICAL ATTENTION IN ALL
CASES. NOTES TO PHYSICIAN: TREAT SYMPTOMATICALLY & SUPPORTIVELY.

=====
===== Fire Fighting Measures =====

Extinguishing Media:USE AGENT MOST APPROPRIATE TO EXTINGUISH
SURROUNDING FIRE.

Fire Fighting Procedures:WEAR A SELF CONTAINED BREATHING APPARATUS IN
PRESSURE-DEMAND, MSHA/NIOSH (APPROVED) & FULL PROTECTIVE GEAR.

Unusual Fire/Explosion Hazard:THIS MATERIAL, IS AN EXPLOSION HAZARD
WHEN EXPOSED TO MECHANICAL SHOCK/FRICTION. CONTACT W/COMBUSTIBLE
MATERIAL MAY CAUSE A FIRE.

=====
===== Accidental Release Measures =====

Spill Release Procedures:VACUUM/SWEEP UP MATERIAL & PLACE INTO A
SUITABLE DISPOSAL CONTAINER. AVOID GENERATING DUSTY CONDITIONS.
REMOVE ALL SOURCES OF IGNITION.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A TIGHTLY CLOSED CONTAINER.
STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM
INCOMPATIBLE/COMBUSTIBLE MATERIALS & OTHER IGNITION SOURCES.

Other Precautions:USE W/ADEQUATE VENTILATION. MINIMIZE DUST
GENERATION/ACCUMULATION. AVOID CONTACT W/EYES/SKIN/CLOTHING. EMPTY
CONTAINERS RETAIN PRODUCT RESIDUE. DON'T
PRESSURIZE/CUT/WELD/BRAZE/SOLDER/DRILL/GRIND/EXPOS E CONTAINERS TO
HEAT/SPARKS/OPEN FLAMES.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE A NIOSH-APPROVED RESPIRATOR WHEN NECESSARY.
Ventilation:USE ADEQUATE VENTILATION TO KEEP AIRBORNE CONCENTRATIONS
LOW.

Protective Gloves:REQUIRED

Eye Protection:EYEGASSES/CHEMICAL SAFETY GOGGLES

Other Protective Equipment:PROTECTIVE CLOTHING

Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING & SHOES
BEFORE REUSE.

Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:270F

Melt/Freeze Pt:M.P/F.P Text:110F

Vapor Pres:<0.1

Spec Gravity:1.82

Solubility in Water:266%

Appearance and Odor:SOLID WHITE DELIQUESCENT MASS W/NO ODOR

=====
===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

COMBUSTIBLE MATERIALS, REDUCING AGENTS, ORGANIC MATTER

Stability Condition to Avoid:HEAT, SPARKS, OPEN FLAME & OTHER IGNITION
SOURCES

Hazardous Decomposition Products:OXIDES OF NITROGEN

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE &
FEDERAL REGULATIONS. UN1454.

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

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

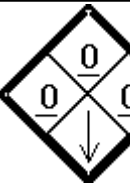
This product has a WHMIS classification of Not controlled..

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

Hazard	1*
Health	0
Environment	0
Protection	e

MATERIAL SAFETY DATA SHEET



SECTION I - CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product Name: 508 Cement
Manufacturer: Insulating and Finishing Cement
Supplier: BNZ Materials, Inc.
 6901 S. Pierce Street, Suite 260
 Littleton, CO 80128, USA

MSDS Number: BNZ-405
Revision: 8
Date Issued: June 4, 2006
24 hour Emergency Number (ChemTrec®): 800-424-9300

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS Number	%	TLV	PEL
Silica	1318-00-9	40-65	3 mg/m ³	5 mg/m ³
	12269-78-2	5-10	3 mg/m ³	5 mg/m ³
	Variable	15-30	2 mg/m ³	5 mg/m ³
Cement	65997-17-3	2-6	15 mg/m ³	15 mg/m ³
	7632-00-0	0-2	None est.	None est.
Other	14808-60-7	0.1-20	0.05 mg/m ³	0.1 mg/m ³

TLV = ACGIH, 8 hr. time weighted average (TWA); PEL = OSHA permissible exposure limit.
 TLV and PEL limits are for total respirable dust.

SECTION III - HAZARDS IDENTIFICATION

Product Overview: This product contains crystalline silica which is considered a chronic health hazard by inhalation. The International Agency for Research on Cancer (IARC) has classified occupational exposures to respirable crystalline silica as being carcinogenic to humans (Class 1). This classification is based on what IARC considered sufficient evidence from epidemiological studies of humans for the carcinogenicity of inhaled silica in the forms of dust.

. Crystalline silica is also known to cause Silicosis, a non-cancerous lung disease.

ing: **Health:** 1* **Fire:** 0 **Reactivity:** 0 **Other:** 0
ass: D-2A - Material causing other toxic effects (VERY TOXIC - Chronic)

outes of Entry: Via respirable dust to the lungs and respiratory system and via coarse dust and particulate to the eyes.

arget Organs: Lungs, respiratory system and eyes.

Health Effects:

nalation: Long term overexposure to respirable crystalline silica dust may cause permanent and irreversible lung damage including silicosis.

in Contact: Possible dryness or transitory irritation resulting from long term exposures to product dust.

e Contact: A mechanical irritant which can cause moderate to severe eye irritation.

gestion: Non-hazardous when ingested. Potentially a mild Irritant to the GI tract if excessive quantity is ingested.

onditions Aggravated by Exposure: Pre-existing chronic upper respiratory and lung diseases such as, but not limited to, bronchitis, emphysema.

nicity: This product contains crystalline silica which is classified as a class 1, human carcinogen by IARC, as a suspect carcinogen by NTP and a known carcinogen by OSHA.

SECTION IV - FIRST AID MEASURES

Remove to fresh air. Drink water to clear throat and blow nose to evacuate dust. If coughing and irritation develop, call a physician.

Flush with large amounts of water until irritation subsides, as least 15 minutes. See a physician if irritation persists.

Normal good personal hygiene practices. Wash with mild soap and warm water after each exposure.

Emergency procedures not normally required. May be a temporary irritant to the GI system.

SECTION V - FIREFIGHTING MEASURES

ing: **Health:** 0 **Fire:** 0 **Reactivity:** 0 **Other:** 0
LEL: N/Ap **UEL:** N/Ap

Ext and Method: This is a non-flammable product

ing Method: Not applicable. Product will not burn.

refighting Procedures: Not applicable.

losion Hazards: The cement products described above are non-flammable. However, the paper packaging is combustible, and due care should be taken to minimize fire hazards.

SECTION VI - ACCIDENTAL RELEASE MEASURES

Procedures: Shovel material into waste container taking care to minimize dust. Dampen if necessary to control dust. Vacuum clean dust w
fitted with HEPA filter

Precautions: If dusty conditions exist, wear a face mask approved for use with dusts such as 3M 8511 N-95 or equivalent.

Personal Precautions: None normally required.

SECTION VII - HANDLING AND STORAGE

Requirements: Store in dry area. Always segregate materials by major hazard class.

Sensitivity or Incompatibility: Avoid contact with strong acids.

Precautions: Assure proper respiratory protection if dust potential exceeds PEL/TLV.

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: : When over PEL/TLV wear an approved face mask such as 3M 8511 N-95 or equivalent, to protect against silica and
emphysema producing dust. Concentrations of dust that exceed the recommendations of the dust mask manufacturer will need a higher level of r
such as a half mask respirator with appropriate dust filters.

Eye Protection: Wear safety glasses with side shields or goggles to protect eyes against dust and particulate when mixing dry cement.

Hand Protection: Under normal conditions the wearing of protective gloves and clean, body-covering clothing should be adequate.

Engineering Controls: Maintain sufficient mechanical or natural ventilation to assure dust concentrations remain below PEL/TLV. Use local exhaust
Power equipment should be equipped with properly designed dust collection devices.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Off white to gray powder with small fibrous nodules. No characteristic odor.

Boiling Point: Not Determined

Specific Gravity: 0.2 to 0.4

Reactivity in Water: Slight

Evaporation Rate: N/Ap

SECTION X - REACTIVITY

Product is stable under normal conditions.

Stability: **Self Polymerization:** Cannot occur.

Reactivity: **Incompatibilities:** None in designed use.

Reaction Products: None.

Effects to Avoid: None in designed use.

SECTION XI - TOXICOLOGICAL/ECOLOGICAL INFORMATION

LC₅₀: N/Av

Acute Hazards: No toxicological studies of this specific product have been performed.

Chronic Hazards: Most ingredients in this product are naturally occurring minerals. Unless contaminated in service, this product is non-hazardous in service.

Reproductive Toxicity, Mutagenicity, other Reproductive Effects: None known

SECTION XII - DISPOSAL CONSIDERATIONS

Disposal Method: May be disposed in an approved landfill unless contaminated in service. If contaminated with hazardous materials, place in a suitable waste container. Seal and properly label the waste container. Send the container to an approved Transportation, Storage and Disposal (TSD) facility or to a licensed waste hauler. Be sure manifests have been completed and an adequate "Paper trail" has been established.

SECTION XIII - TRANSPORTATION INFORMATION

Shipping Name: Not regulated

DOT Label: None

UN/NA Number: None

TDG Shipping Description: Not regulated as dangerous goods according to Canadian TDGA

International Dangerous Goods Information:

Not regulated as dangerous goods according to the IMDG Code.

Not regulated as dangerous goods according to the IACO Technical Instructions.

SECTION XIV - REGULATORY INFORMATION

OSHA Hazards: This product is considered hazardous under OSHA criteria.

TEQPA Status: All components of this product are included in the TSCA and CEPA Chemical Inventories.

Reportable Quantity: N/Av

Section III:

Section 302 Extremely Hazardous: This product contains no extremely hazardous substances as defined and listed in section #302

Section 311/312 Hazard Categories: Reportable as a hazardous substance. Check with your Local Emergency Planning Committee for reportable quantities.

Section 313 Toxic Chemicals: This product does not contain substances which are reportable under Section 313.

WHMIS Information: WHMIS Classification: D-2A - Material causing other toxic effects (VERY TOXIC - Chronic). This product has been classified in

with the hazard criteria of the Controlled Products Regulations (CPR).

Regulatory Classifications:

- C) R36 - Irritating to eyes
- R39 - Danger of very serious irreversible effects
- R45 - May cause cancer

SECTION XV - APPROVALS

Issue: WHMIS 3 year update

Approval Date: June 4, 2003

by: CCG, Inc.

Supersedes Date: June 4, 2003

History: Update HMIS Data, May 5, 2002; Change to Crystalline (TLV standard (0.05 mg/m³). Removal of Product Stewardship (June 4, 2003).

SECTION XVI - DISCLAIMER

ate of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and provincial laws. However, no warranty or representation of law or fact, with respect to such information, is intended or given.

International Chemical Safety Cards

CHLOROBENZENE

ICSC: 0642

CHLOROBENZENE
Benzene chloride
Chlorobenzol
MCB
Phenyl chloride
C₆H₅Cl
Molecular mass: 112.6

CAS # 108-90-7
RTECS # CZ0175000
ICSC # 0642
UN # 1134
EC # 602-033-00-1

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 27°C explosive vapour/air mixtures may be formed.	Above 27°C use a closed system, ventilation, and explosion-proof electrical equipment.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS! STRICT HYGIENE!	IN ALL CASES CONSULT A DOCTOR!
• INHALATION	Drowsiness. Headache. Nausea. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Half-upright position. Artificial respiration if indicated. Refer for medical attention.
• SKIN	Redness. Roughness.	Protective gloves.	First rinse with plenty of water, then remove contaminated clothes and rinse again. Refer for medical attention.
• EYES	Redness.	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. (See Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: filter respirator for organic gases and vapours).	Fireproof. Separated from strong oxidants. Cool.	Xn symbol N symbol R: 10-20-51/53 S: (2-)24/25-61 UN Hazard Class: 3 UN Packing Group: III
SEE IMPORTANT INFORMATION ON BACK		
ICSC: 0642		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

CHLOROBENZENE

ICSC: 0642

I M P O R T A N T D A T A	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.</p> <p>PHYSICAL DANGERS: The vapour is heavier than air and may travel along the ground; distant ignition possible.</p> <p>CHEMICAL DANGERS: The substance decomposes on heating, on burning and on contact with hot surfaces, producing corrosive and toxic fumes including phosgene, hydrogen chloride. Reacts violently with strong oxidants, dimethyl sulfoxide causing fire and explosion hazard. Attacks rubber and some plastics.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV: 10 ppm; 46 mg/m³ (as TWA) (ACGIH 1996). MAK: 10 ppm; 50 mg/m³; (1995).</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its vapour and by ingestion.</p> <p>INHALATION RISK: A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. Exposure may result in unconsciousness. The effects may be delayed. Medical observation is indicated.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: The substance may have effects on the central nervous system, blood, liver, and kidneys.</p>
PHYSICAL PROPERTIES	Boiling point: 132°C Melting point: -45°C Relative density (water = 1): 1.11	Relative vapour density (air = 1): 3.88 Flash point: 27°C c.c. Auto-ignition temperature: 590°C

	Solubility in water, g/100 ml at 25°C: 0.02 Explosive limits, vol% in air: 1.3-11 Vapour pressure, kPa at 20°C: 1.17 Octanol/water partition coefficient as log Pow: 2.18-2.84
ENVIRONMENTAL DATA	It is strongly advised not to let the chemical enter into the environment.
NOTES	
The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding.	
Transport Emergency Card: TEC (R)-90 NFPA Code: H2; F3; R0;	
ADDITIONAL INFORMATION	
ICSC: 0642	CHLOROBENZENE
© IPCS, CEC, 1993	
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.

Material Safety Data Sheet

Chloroform

ACC# 04770

Section 1 - Chemical Product and Company Identification

MSDS Name: Chloroform

Catalog Numbers: AC95232184, S79960, S79960-1, S79960HPLC-2, S79960SPEC-1, S79960SPEC-2, C2974LC, C297POP19, C297POP200, C297POP50, C297RS115, C297RS200, C297RS28, C297RS50, C297SS115, C297SS19, C297SS200, C297SS28, C297SS50, C29820LC, C298FB115, C298FB19, C298FB200, C298FB50, C298J1, C298POP19, C298POP200, C298POP50, C298POPB19, C298POPB200, C298POPB50, C298RB115, C298RB19, C298RB200, C298RB50, C298RB500, C298RS115, C298RS19, C298RS200, C298RS28, C298RS50, C298SS-11, C298SS19, C298SS28, C605-1, C605-4, C606POP19, C606POP200, C606POP50, C606RS115, C606RS200, C606RS28, C606RS50, C606SS115, C606SS19, C606SS200, C606SS28, C606SS50

Synonyms: Formyl Trichloride; Methane Trichloride; Methenyl Trichloride; Methyl Trichloride; Trichlormethan; Trichloroform; Trichloromethane.

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
67-66-3	Chloroform	100	200-663-8
25377-72-4	Amylene	<1.0	246-916-6

Hazard Symbols: XN

Risk Phrases: 22 38 40 48/20/22

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. May cause central nervous system depression. May cause cardiac disturbances. May cause cancer based on animal studies. This substance has caused adverse reproductive and fetal effects in animals. May be harmful if swallowed.

Caution! Causes eye and skin irritation. Causes digestive and respiratory tract irritation. Light sensitive.

Target Organs: Blood, kidneys, heart, central nervous system, liver, cardiovascular system, excretory system, reproductive system.

Potential Health Effects

Eye: Causes moderate eye irritation. Contact with liquid causes immediate burning pain, tearing, and reddening of the conjunctiva.

Skin: Causes mild skin irritation. Prolonged or repeated contact may dry/defat the skin and cause irritation. Absorption of liquid through intact skin is possible and may cause systemic poisoning if contact with liquid is prolonged.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver damage. May cause cardiac disturbances. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. Possible aspiration hazard. May cause hallucinations and distorted perceptions.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause cardiac sensitization and possible failure. Inhalation of large amounts may cause respiratory stimulation, followed by respiratory depression, convulsions and possible death due to respiratory paralysis. May be absorbed through the lungs. Causes irritation of the mucous membrane and upper respiratory tract.

Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause dermatitis. May cause reproductive and fetal effects. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects. Toxicity may be increased by exposure to alcohol, steroids, and ketones. Prolonged exposure may cause liver, kidney, and heart 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: 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: Causes cardiac sensitization to endogenous catecholamines which may lead to cardiac arrhythmias. Do NOT use adrenergic agents such as epinephrine or pseudoepinephrine. Persons with liver, kidney, or central nervous system diseases may be at increased risk from exposure to this product. Alcoholic beverage consumption may enhance the toxic effects of this substance. Effects may be delayed.

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. Substance is nonflammable. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Do NOT get water inside containers. Do NOT use straight streams of water. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use water spray, fog or regular foam. Cool containers with flooding quantities of water until well after fire is out.

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: 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. Approach spill from upwind.

Section 7 - Handling and Storage

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. Do not breathe dust, vapor, mist, or gas. Do not ingest or inhale. Store protected from light.

Storage: Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not store near alkaline substances. Separate from strong mineral 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 general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chloroform	10 ppm TWA	500 ppm IDLH	50 ppm Ceiling; 240 mg/m ³ Ceiling
Amylene	none listed	none listed	none listed

OSHA Vacated PELs: Chloroform: 2 ppm TWA; 9.78 mg/m³ TWA Amylene: 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: Liquid

Appearance: clear, colorless

Odor: sweet, fruity odor - ethereal odor

pH: Not available.

Vapor Pressure: 160 mm Hg @ 20 deg C

Vapor Density: 4.12 (Air=1)

Evaporation Rate:11.6 (Butyl acetate=1)

Viscosity: 0.58 cps @ 20 deg C

Boiling Point: 60.5-61.5 deg C

Freezing/Melting Point:-63 deg C

Decomposition Temperature:Not available.

Solubility: Slightly soluble.

Specific Gravity/Density:1.492 (Water=1)

Molecular Formula:CHCl₃

Molecular Weight:119.366

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.

Incompatibilities with Other Materials: Strong oxidizing agents, aluminum, fluorine, magnesium, sodium potassium, lithium, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), dinitrogen tetroxide, sodium + methanol, potassium-tert-butoxide, chemically active metals, Attacks some forms of plastics, rubbers, and coatings., nitrogen tetroxide, acetone + alkali, disilane, perchloric acid + phosphorus pentoxide, sodium methylate, triisopropylphosphine, sodium methoxide + methanol.

Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide, chlorine, phosgene gas.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 67-66-3: FS9100000

CAS# 25377-72-4 unlisted.

LD50/LC50:

CAS# 67-66-3:

Draize test, rabbit, eye: 148 mg;

Draize test, rabbit, eye: 20 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = 47702 mg/m³/4H;

Oral, mouse: LD50 = 36 mg/kg;

Oral, rat: LD50 = 695 mg/kg;

Skin, rabbit: LD50 = >20 gm/kg;<BR.

CAS# 25377-72-4:<BR.

Carcinogenicity:

CAS# 67-66-3:

ACGIH: A3 - Animal Carcinogen

California: carcinogen; initial date 10/1/87

NIOSH: potential occupational carcinogen

NTP: Suspect carcinogen

OSHA: Possible Select carcinogen

IARC: Group 2B carcinogen CAS# 25377-72-4: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: Oral, rat: TDLo = 13832 mg/kg/2Y-C (Tumorigenic - Carcinogenic by RTECS criteria - Blood - leukemia).; Oral, mouse: TDLo = 127 gm/kg/92W-I (Tumorigenic - Carcinogenic by RTECS criteria - Liver - tumors).; Oral, rat: TD = 98 gm/kg/78W-I (Tumorigenic - neoplastic by RTECS criteria - Kidney, Ureter, Bladder - Kidney tumors and Endocrine - thyroid tumors).; Oral, mouse: TD = 18 gm/kg/17W-I (Tumorigenic - neoplastic by RTECS criteria - Liver - tumor s).;

Teratogenicity: Oral, rat: TDLo = 1260 mg/kg (female 6-15 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) Specific Developmental Abnormalities - musculoskeletal system.; Inhalation, rat: TCLo = 100 ppm/7H (female 6-15 day(s) after conception) Specific Developmental Abnormalities -

gastrointestinal system and homeostasis.; Inhalation, mouse: TCl_o = 100 ppm/7H (female 8-15 day(s) after conception) Specific Developmental Abnormalities - craniofacial (including nose and tongue).

Reproductive Effects: Inhalation, rat: TCl_o = 30 ppm/7H (female 6-15 day(s) after conception) Fertility - other measures of fertility.; Inhalation, rat: TCl_o = 300 ppm/7H (female 6-15 day(s) after conception) Fertility - female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated) and post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).

Neurotoxicity: No information available.

Mutagenicity: DNA Inhibition: Human, HeLa cell = 19 mmol/L.; Sister Chromatid Exchange: Human, Lymphocyte = 10 mmol/L.; Micronucleus Test: Oral, rat = 4 mmol/kg.; Unscheduled DNA Synthesis: Oral, rat = 1 gm/kg.; Sister Chromatid Exchange: Hamster, Embryo = 100 umol/L.

Other Studies: Open irritation test: Administration onto the skin (rabbit) 10 mg/24H (Mild). Standard Draize Test: Administration onto the skin (rabbit) = 500 mg/24H (Mild). Standard Draize Test: Administration into the eye (rabbit) = 20 mg /24H (Moderate).

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC₅₀ = 75 ppm; 96 Hr; Unspecified Rainbow trout: LC₅₀ = 43.8 mg/L; 96 Hr; Static bioassay Fathead Minnow: LC₅₀ = 129.0 mg/L; 96 Hr; Static bioassay (pH = 7.6-8.3) Bluegill/Sunfish: LC₅₀ = 100.0 mg/L; 96 Hr; Static bioassay flea Daphnia: EC₅₀ = 28.9 mg/L; 48 Hr; Static bioassay The majority of the environmental releases from industrial uses are to the atmosphere; releases to water and land will be primarily lost by evaporation and will end up in the atmosphere. Release to the atmosphere may be transported long distances and will photodegrade with a half-life of a few months. Spills and other releases on land will also leach into the groundwater where it will reside for long periods of time.

Environmental: Chloroform will not be expected to bioconcentrate into the food chain but contamination of food is likely due to its use as an extractant and its presence in drinking 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: CAS# 67-66-3: waste number U044.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	CHLOROFORM				CHLOROFORM
Hazard Class:	6.1				6.1(9.2)
UN Number:	UN1888				UN1888
Packing Group:	III				II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 67-66-3 is listed on the TSCA inventory.

CAS# 25377-72-4 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 67-66-3: Effective Date: 6/1/87; Sunset Date: 6/1/97

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# 67-66-3: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 67-66-3: 10,000 lb TPQ

SARA Codes

CAS # 67-66-3: acute, chronic. CAS # 25377-72-4: acute, flammable.

Section 313

This material contains Chloroform (CAS# 67-66-3, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 67-66-3 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# 67-66-3 is listed as a Hazardous Substance under the CWA. CAS# 67-66-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 67-66-3 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# 67-66-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 25377-72-4 can be found on the following state right to know lists: New Jersey.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act: WARNING: This product contains Chloroform, a chemical known to the state of California to cause cancer. California No Significant Risk Level: CAS# 67-66-3: 20 ug/day NSRL (oral); 40 ug/day NSRL (inhalation)

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 38 Irritating to skin.

R 40 Limited evidence of a carcinogenic effect.

R 48/20/22 Harmful : danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 67-66-3: 3

CAS# 25377-72-4: No information available.

Canada - DSL/NDSL

CAS# 67-66-3 is listed on Canada's DSL List.

CAS# 25377-72-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, D1B.

Canadian Ingredient Disclosure List

CAS# 67-66-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 67-66-3: OEL-ARAB Republic of Egypt:TWA 10 ppm (50 mg/m³) OEL-AUSTRALIA:TWA 10 ppm (50 mg/m³);Carcinogen OEL-AUSTRIA:TWA 10 ppm (50 mg/m³) OEL-BELGIUM:TWA 10 ppm (49 mg/m³);Carcinogen JAN9 OEL-CZECHOSLOVAKIA:TWA 10 mg/m³;STEL 20 mg/m³ OEL-DENMARK:TWA 2 ppm (10 mg/m³);Carcinogen OEL-FINLAND:TWA 10 ppm (50 mg/m³);STEL 20 ppm;Skin;CAR OEL-FRANCE:TWA 5 ppm (25 mg/m³);STEL 50 ppm (250 mg/m³);CAR OEL-GERMANY :TWA 10 ppm (50 mg/m³);Carcinogen JAN9 OEL-HUNGARY:STEL 10 mg/m³ OEL-INDIA:TWA 10 ppm (50 mg/m³);Carcinogen OEL-JAPAN:TWA 50 ppm (240 mg/m³);Carcinogen OEL-THE NETHERLANDS:TWA 10 ppm (50 mg/m³) OEL-THE PHILIPPINES:TWA 50 ppm (240 mg/m³) OEL-POLAND:TWA 50 mg/m³ OEL-RUSSIA:TWA 50 ppm OEL-SWEDEN:TWA 2 ppm (10 mg/m³);STEL 5 ppm (25 mg/m³);CAR OEL-SWITZERLAND:TWA 10 ppm (50 mg/m³);STEL 20 ppm (100 mg/m³) OEL-THAILAND:TWA 50 ppm (240 mg/m³) OEL-TURKEY:TWA 50 ppm (240 mg/m³) OEL-UNITED KINGDOM:TWA 2 ppm (9.9 mg/m³);Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGIH TLV

Material Safety Data Sheet

Chromium (III) Nitrate Nonahydrate

ACC# 04965

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium (III) Nitrate Nonahydrate

Catalog Numbers: S93177, C331-100, C331-500, S76785

Synonyms: Chromic Nitrate Nonahydrate; Nitric Acid Chromium Salt Nonahydrate.

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
7789-02-8	CHROMIUM (III) NITRATE NONAHYDRATE	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: purple solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Harmful if swallowed. May cause methemoglobinemia.

Target Organs: Blood, respiratory system, blood forming organs.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

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

Inhalation: May cause respiratory tract irritation.

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. Effects may be delayed.

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. 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.

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. 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 extinguishing media most appropriate for the surrounding fire. 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: 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. 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 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
CHROMIUM (III) NITRATE NONAHYDRATE	none listed	none listed	none listed

OSHA Vacated PELs: CHROMIUM (III) NITRATE NONAHYDRATE: 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: Solid
Appearance: purple
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 100 deg C decomposes
Freezing/Melting Point:140 deg C
Decomposition Temperature:100 deg C
Solubility: Soluble in water.
Specific Gravity/Density:1.80
Molecular Formula:Cr(NO3)3.9H2O
Molecular Weight:400.1313

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, dust generation, excess heat, combustible materials, reducing agents.
Incompatibilities with Other Materials: Reducing agents.
Hazardous Decomposition Products: Nitrogen oxides, chromium dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7789-02-8: GB6300000
LD50/LC50:
CAS# 7789-02-8:
Oral, rat: LD50 = 3250 mg/kg;

Carcinogenicity:
CAS# 7789-02-8: 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:	CHROMIUM NITRATE	CHROMIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN2720	UN2720
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7789-02-8 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.

SARA Codes

CAS # 7789-02-8: immediate, delayed, fire.

Section 313

This material contains CHROMIUM (III) NITRATE NONAHYDRATE (listed as Water Dissociable Nitrate Compounds), 100%, (CAS# 7789-02-8) 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:

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# 7789-02-8 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:

XN 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# 7789-02-8: 2

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 C, 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# 7789-02-8 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Clove Oil

ACC# 05214

Section 1 - Chemical Product and Company Identification

MSDS Name: Clove Oil

Catalog Numbers: S79970, S79961

Synonyms: Oil of clove

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
8000-34-8	Clove oil		unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to light yellow liquid.

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

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: 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.

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: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Nonflammable.

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: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container.

Section 7 - Handling and Storage

Handling: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Use with adequate ventilation. 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: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Clove oil	none listed	none listed	none listed

OSHA Vacated PELs: Clove 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: 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: colorless to light yellow

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: >1 (ether=1)

Viscosity: Not available.

Boiling Point: 250 deg C

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Insoluble in water.

Specific Gravity/Density: 1.0

Molecular Formula: Variable

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Strong oxidants.

Incompatibilities with Other Materials: None reported.

Hazardous Decomposition Products: Acrid smoke and fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 8000-34-8: GF6890000; GF6900000; GF6910000

LD50/LC50:

CAS# 8000-34-8:

Draize test, rabbit, skin: 500 mg/24H Severe;

Oral, rat: LD50 = 1370 mg/kg;

Oral, rat: LD50 = 2650 mg/kg;

Oral, rat: LD50 = 2020 mg/kg;

Skin, rabbit: LD50 = 1200 mg/kg;

Skin, rabbit: LD50 = 5 gm/kg;

Skin, rabbit: LD50 = >5 gm/kg;

Carcinogenicity:

CAS# 8000-34-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: Mutation data reported.

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# 8000-34-8 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.

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# 8000-34-8 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:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 8000-34-8: No information available.

Canada - DSL/NDSL

CAS# 8000-34-8 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

AMERICAN TECHNICAL COATING -- TT0091 INTERIOR CONCRETE FLOOR PAINT --
8010-00-597-8199

=====
Product Identification
=====

Product ID:TT0091 INTERIOR CONCRETE FLOOR PAINT
MSDS Date:07/21/1993
FSC:8010
NIIN:00-597-8199
MSDS Number: BSRK
=== Responsible Party ===
Company Name:AMERICAN TECHNICAL COATING
Address:400 WEST CENTRAL BLVD
City:CAPE CANAVERAL
State:FL
ZIP:32920
Country:US
Info Phone Num:800-868-0198
Emergency Phone Num:800-424-9300 CHEMTREC/ 800-332-3136
Preparer's Name:LADY KAIVANEY
CAGE:0LB61

==== Contractor Identification ====

Company Name:AMERICAN TECHNICAL COATINGS CORP
Address:192 CENTER ST
Box:City:CAPE CANAVERAL
State:FL
ZIP:32920
Country:US
Phone:407-783-8474
CAGE:0LB61

=====
Composition/Information on Ingredients
=====

Ingred Name:MINERAL SPIRITS
CAS:64742-47-8
Fraction by Wt: 25-35%
Other REC Limits:NONE SPECIFIED

Ingred Name:VM&P NAPHTHA
CAS:8030-30-6
RTECS #:DE3030000
Fraction by Wt: 25-35%
Other REC Limits:NONE SPECIFIED

=====
Hazards Identification
=====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Health Hazards Acute and Chronic:EFFECTS OF ACUTE EXPOSURE: INHALATION
MAY IRRITATE THE RESPIRATORY TRACT. INHALATION MAY CAUSE WEAKNESS,
DIZZINESS, HEADACHE, NAUSEA.
EFFECTS OF CHRONIC EXPOSURE: PROLONGED OR REPEATED SKIN
CONTACT MAY CAUSE DERMATITIS. MAY CAUSE ASTHMA-LIKE SPASM &
BREATHING DIFFICULTY.
Effects of Overexposure:SKIN: MAY IRRITATE. EYE: MAY IRRITATE.

=====
First Aid Measures
=====

First Aid:EYES: FLUSH IMMEDIATELY WITH FLOWING WATER FOR AT LEAST 15 MINUTES. SKIN: CONSULT A PHYSICIAN IF IRRITATION DEVELOPS. FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES AND CONSULT A PHYSICIAN IMMEDIATELY. INGESTION: CONSULT A DOCTOR IMMEDIATELY. INHALATION: REMOVE TO FRESH AIR. ASSIST BREATHING IF NECESSARY. CONSULT A PHYSICIAN IMMEDIATELY.

===== Fire Fighting Measures =====

Flash Point Method:OC
Flash Point:44.6F,7.0C
Lower Limits:1
Upper Limits:6
Extinguishing Media:WATER FOG, CO2, FOAM, DRY CHEMICAL
Fire Fighting Procedures:WEAR SCBA IN CONFINED AREAS OR WHEN EXPOSED TO COMBUSTION PRODUCTS. USE WATER SPRAY TO COOL FIRE EXPOSED CONTAINERS. COVER WITH SAND OR EARTH.
Unusual Fire/Explosion Hazard:THIS MATERIAL MAY EXPLODE IF EXPOSED TO STATIC DISCHARGE.

===== Accidental Release Measures =====

Spill Release Procedures:DIKE LRG SPILL & PUMP AWAY.COVER W/ABSORBNT MAT'L.REMOVE IGNIT SOURCE.PREVENT DISCHARGE INTO SEWERS/WATERWAY.KEEP PEOPLE AWAY.FORM LRG SFTY ZONE.NOTIFY AUTHORITIES IMMED.WEAR FULL PROTECT GEAR.AVOID E YE/SKIN CONTACT & VAPOR INHAL.SWEEP UP/AVOID DUST.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY LOCATION. GROUND CONTAINERS AND EQUIPMENT TO PREVENT ELECTROSTATIC CHARGES. USE SPARKPROOF TOOLS & EXPLOSION PROOF ELECTRICALS.
Other Precautions:STORE AWAY FROM IGNITION SOURCES. PROTECT FROM HUMIDITY. STORE IN TIGHTLY CLOSED CONTAINERS. AVOID CONTACT WITH EYES, SKIN, CLOTHING. AVOID BREATHING VAPORS. FLUSH PARTIALLY FILLED CONTAINERS WITH DRY NITROGEN.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:APPROVED RESPIRATOR IF TLV IS EXCEEDED.
Ventilation:GENERAL MECHANICAL IS ADEQUATE.
Protective Gloves:WEAR NITRILE RUBBER GLOVES
Eye Protection:CHEMICAL GOGGLES
Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:F2
Boiling Pt:B.P. Text:113 TO 314C
Vapor Pres:9.75 @ 25C
Spec Gravity:1.078 @ 25C
Viscosity:75 KU @ 25 C
Solubility in Water:INSOLUBLE
Appearance and Odor:BROWN VISCOUS LIQUID, PETROLEUM ODOR
Percent Volatiles by Volume:53(WT)

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES

STRONG OXIDIZING AGENTS, ACIDS, ALKALIS

Stability Condition to Avoid: HEAT, PEROXIDES, STRONG OXIDIZING AGENTS,
STRONG ALKALIS

Hazardous Decomposition Products: CARBON MONOXIDE, CARBON DIOXIDE

Conditions to Avoid Polymerization: HEAT, PEROXIDES, STRONG OXIDIZING
AGENTS, STRONG ALKALIS

===== Disposal Considerations =====

Waste Disposal Methods: OBSERVE LOCAL REGULATIONS.

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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.

ALDRICH CHEMICAL CO -- CRESOL RED, SODIUM SALT, INDICATOR GRADE, 1 --
6810-00N037978

=====
Product Identification
=====

Product ID:CRESOL RED, SODIUM SALT, INDICATOR GRADE, 1
MSDS Date:01/31/1992
FSC:6810
NIIN:00N037978
MSDS Number: BQVKX
=== Responsible Party ===
Company Name:ALDRICH CHEMICAL CO
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:CRESOL RED, SODIUM SALT, INDICATOR GRADE
CAS:62625-29-0

=====
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 AND SKIN IRRITATION.
TO THE BEST OF MFR'S 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:EYES: IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT
LEAST 15 MINUTES. SKIN: IMMEDIATELY WASH WITH SOAP AND 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. INGEST: WASH OUT MOUTH
W/WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.

=====
===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY. CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND 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 AND HEAVY RUBBER GLOVES. 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.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:AVOID INHALATION. AVOID CONTACT W/EYES/SKIN/CLTHG. AVOID Prolonged/Repeated Expos. 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:CHEMICAL WORKERS GOGGLES .

Other Protective Equipment:SAFETY SHOWER AND EYE BATH.

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:482F,250C

Appearance and Odor:BROWN 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, SULFUR OXIDES.

=====
===== Disposal Considerations =====

Waste Disposal Methods:DISSOLVE/MIX MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS .

Material Safety Data Sheet

Crotyl chloride

ACC# 05748

Section 1 - Chemical Product and Company Identification

MSDS Name: Crotyl chloride

Catalog Numbers: AC154800000, AC154801000, AC154805000

Synonyms: 1-Chloro-2-butene.

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
563-52-0	1-Butene, 3-chloro-	23 - 28	209-252-8
591-97-9	Crotyl Chloride	65+	209-739-5
1190-22-3	Butane, 1,3-dichloro-	<1	214-718-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless clear liquid. Flash Point: -15 deg C.

Danger! Flammable liquid and vapor. Causes burns by all exposure routes. Harmful if swallowed.

Target Organs: 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.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns.

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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Containers may explode in the heat of a fire. Flammable liquid and vapor.

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

Flash Point: -15 deg C (5.00 deg F)

Autoignition Temperature: 510 deg C (950.00 deg F)

Explosion Limits, Lower:4.2

Upper: 19.0

NFPA Rating: (estimated) Health: 3; Flammability: 3; 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. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a dry area. Flammables-area. Keep refrigerated. (Store below 4°C/39°F.)

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 only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1-Butene, 3-chloro-	none listed	none listed	none listed
Crotyl Chloride	none listed	none listed	none listed
Butane, 1,3-dichloro-	none listed	none listed	none listed

OSHA Vacated PELs: 1-Butene, 3-chloro-: No OSHA Vacated PELs are listed for this chemical. Crotyl Chloride: No OSHA Vacated PELs are listed for this chemical. Butane, 1,3-dichloro-: 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. 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: colorless

Odor: stinging odor

pH: 3 (14g/L aq.sol.)

Vapor Pressure: 494 hPa @ 20 deg C
Vapor Density: 3.12
Evaporation Rate: Not available.
Viscosity: 0.46 mPas 20 deg C
Boiling Point: 80 - 85 deg C @ 760 mmHg
Freezing/Melting Point: -65 deg C
Decomposition Temperature: Not available.
Solubility: +/- 14 g/L (20°C)
Specific Gravity/Density: 0.920
Molecular Formula: C₄H₇Cl
Molecular Weight: 90.55

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 563-52-0: EM4261000
CAS# 591-97-9: EM4264000
CAS# 1190-22-3 unlisted.

LD50/LC50:
Not available.
Not available.
Not available.

Carcinogenicity:
CAS# 563-52-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 591-97-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 1190-22-3: 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

Ecotoxicity: No data available. No information available.

Environmental: Rapidly volatilizes into the atmosphere.

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 LIQUID, CORROSIVE, N.O.S.	FLAMMABLE LIQUID, CORROSIVE, N.O.S.
Hazard Class:	3	3
UN Number:	UN2924	UN2924
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 563-52-0 is listed on the TSCA inventory.

CAS# 591-97-9 is listed on the TSCA inventory.

CAS# 1190-22-3 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# 563-52-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 591-97-9 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

CAS# 1190-22-3 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:

F C

Risk Phrases:

R 11 Highly flammable.

R 22 Harmful if swallowed.

R 34 Causes burns.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

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# 563-52-0: 2

CAS# 591-97-9: 2

CAS# 1190-22-3: No information available.

Canada - DSL/NDSL

CAS# 591-97-9 is listed on Canada's DSL List.

CAS# 563-52-0 is listed on Canada's NDSL List.

CAS# 1190-22-3 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, 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

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: PULMONARY, SKIN DISCOLORATION & ECZEMATOID LESIONS.
CHRONIC: REPRODUCED CONTACT WITH SOME COPPER SALTS (INGESTION)

===== 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, (SUPPLEMENTAL 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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FISHER SCIENTIFIC -- C495, CUPRIC SULFATE -- 6810-00-596-6605

=====
===== Product Identification =====

Product ID:C495, CUPRIC SULFATE
MSDS Date:12/04/1990
FSC:6810
NIIN:00-596-6605
MSDS Number: BNVYX
=== 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:CUPRIC SULFATE (SARA III). EXPOSURE LIMITS LISTED FOR CU.
CAS:7758-98-7
RTECS #:GL8800000
Fraction by Wt: >97%
OSHA PEL:1MG/M3 DUST;0.1 FUME
ACGIH TLV:1MG/M3 DUST;0.2 FUME
EPA Rpt Qty:10 LBS
DOT Rpt Qty:10 LBS

Ingred Name:SUPP DATA: HAS BEEN REPORTED. EYE: ACUTE - MAY CAUSE
CONJUNCT, CORNEAL ULCERATION/TURBIDITY AND PALPEBRAL EDEMA. (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2: CHRONIC - RPTD/PRLNG USE OF SOLID COPPER SULFATE FOR
TREATMENT OF TRACHOMA PRDCED INFLAMM & PURULENT RXN, (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3: AND DISCOLORATION OF CORNEA. WHEN A PARTICLE OF
COPPER SULFATE WAS LEFT ACCIDENTALLY IN CONJUNCTIVAL SAC, (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4: IT CAUSED MORE SEVERE LOCAL INFLAMM & NECROSIS,
CORNEAL OPACITY & SYMBLEPHARON. INGEST: ACUTE - MAY CAUSE (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5: SALIVATION/NAUS/VOMIT/GASTRIC PAIN/LOC

CORR/HEMORR/BLUE DISCOLORATION OF GUMS & TONGUE/HEMOLYTIC ANEMIA/
(ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6: HEMORRHAGIC GASTRITIS/COLIC & DIARR W/BLOODY STOOLS.
LIVER/KIDNEY DMG W/SEV ANEMIA MAY OCCUR W/POSSIBLE (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7: SOMNOLENCE & COMA. DEATH MAY OCCUR FROM CIRCULATORY
FAILURE. MINIMAL LETHAL ORAL DOSE FOR ADULT APPEARS (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8: TO BE 10 GRAMS. CHRONIC - CHRONIC HUMAN POISON HAS
ONLY BEEN REPORTED IN INDIVIDUALS W/WILSON'S DISEASE. (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9: THIS DISEASE IS RARE GENETIC CNDTN IN WHICH THERE
MAY BE ABNORMALLY HIGH ABSORPTION, RETENTION & STORAGE (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10: OF COPPER BY THE BODY. THIS ACCUM HAS BEEN NOTED TO
PRECEDE THE DEVEL OF LIVER PATHOLOGY, WHICH MAY (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11: ULTIMATELY PROVE FATAL.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: AND LOWER LIDS, UNTIL NO EVIDENCE OF
CHEMICAL REMAINS (APPROX 15-20 MIN). GET MED ATTN IMMED. (ING 14)
RTECS #:9999999ZZ

Ingred Name:ING 13: INGEST: DILUTE THE POISON IMMED W/LG AMTS OF
WATER/MILK & REMOVE BY GASTRIC LAVAGE UNLESS THE VICTIM IS (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14: ALREADY VOMIT. GET MED ATTN IMMED. ADMIN OF GASTRIC
LAVAGE SHLD BE PERFORMED BY QUALIFIED MED PERS. (ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15: ANTIDOTE: THE DECISION AS TO WHETHER THE SEVERITY
OF POISONING REQ ADMIN OF ANY ANTIDOTE & ACTUAL DOSE (ING 17)
RTECS #:9999999ZZ

Ingred Name:ING 16: SHLD BE MADE BY QUALIFIED MED PERS. GIVE CALCIUM
DISODIUM EDETATE 15-25MG/KG (0.08-0.125 ML OF 20% SOLN (ING 18)
RTECS #:9999999ZZ

Ingred Name:ING 17: PER KG BODY WT) IN 250-500ML OF 5% DEXTROSE
INTRAVENOUSLY OVER A 1-2 HR PERIOD TWICE DAILY. THE MAX DOSE(ING
19)
RTECS #:9999999ZZ

Ingred Name:ING 18: SHLD NOT EXCEED 50MG/KG/DAY. DRUG SHLD BE GIVEN IN
5-DAY COURSES W/REST PERIOD OF AT LST 2 DAYS BETWEEN (ING 20)
RTECS #:9999999ZZ

Ingred Name:ING 19: AFTER FIRST COURSE, SUBSEQUENT COURSES SHLD NOT

EXCEED 50MG/KG/DAY. DAILY URINALYSES SHLD NOT BE DONE (ING 21)
RTECS #:9999999ZZ

Ingred Name:ING 20: DURING TREATMENT PERIOD. DOSAGE SHLD BE REDUCED IF
ANY UNUSUAL URINARY FINDING APPEAR. INTRAVENOUS ADMIN(ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 21: IS CONTRAINDICATED IN PRESENCE OF ELEVATED
CEREBROSPINAL FLUID PRESS. PENICILLAMINE IS ALSO EFTIVE IN (ING 23)
RTECS #:9999999ZZ

Ingred Name:ING 22: COPPER POISONING. GIVE UP TO 100 MG/KG/DAY (MAX 1
G/DAY) DIVIDED INTO 4 DOSES FOR NO LONGER THAN 1 WK. (ING 24)
RTECS #:9999999ZZ

Ingred Name:ING 23: IF LONGER ADMIN PERIOD IS WARRANTED, DOSAGE SHLD
NOT EXCEED 40 MG/KG/DAY. GIVE THE DRUG ORALLY, HALF AN (ING 25)
RTECS #:9999999ZZ

Ingred Name:ING 24: HOUR BEFORE MEALS.
RTECS #:9999999ZZ

=====
===== 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:INHAL: ACUTE - MAY CAUSE IRRIT OF
UPPER RESP TRACT. WORKERS EXPOS TO COPPER SALTS IN DUST FORM
COMPLAINED OF METALLIC TASTE W/IRRIT OF NASAL/ORAL MUCOSA. CHRONIC
- RPTD/PRLNG EXPOS MAY PRDCE SEV CONGE STION OF NASAL MUCOSA
W/RHINITIS & POSSSLOUGHING/ULCERATION. SKIN CONT: ACUTE - MAY CAUSE
ITCHING, (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ: PAPULOVESICULAR & ECZEMATOID LESION.
CHRONIC - RPTD/PRLNG EXPOS MAY CAUSE SOME DEGREE OF NECROSIS.
ALLERGIC CONT DERMAT HAS BEEN REPORTED. RPTD APPLICATIONS TO
EXTENSIVE AREAS OF BURNED SKIN MAY CAUSE BLUE DISCOLORATION OF
GUMS &TONGUE/HEMOLYTIC ANEMIA/HEMORRHAGIC GASTRITIS/ COLIC & DIARR
W/BLOODY(SUPP DATA)
Medical Cond Aggravated by Exposure:PERSONS WITH A HISTORY OF CHRONIC
RESPIRATORY OR SKIN DISEASE OR WILSON'S DISEASE.

=====
===== First Aid Measures =====

First Aid:INHAL: MOVE TO FRESH AIR IMMED. IF BRTHG STOPPED, PERFORM
ARTF RESP. KEEP WARM/AT REST. TREAT SYMPTOMATICALLY/SUPPORTIVELY.
GET MED ATTN IMMED. SKIN: REMOVE CONTAMD CLTHG/SHOES IMMED. WASH
AFFECTED AR EA W/SOAP OR MILD DETERGENT & LG AMTS OF WATER UNTIL NO
EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MED ATTN IMMED.
EYES: WASH IMMED W/LG AMTS OF WATER OR NORM SALINE, OCCAS LIFTING
UPPER(ING 13)

=====
===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR
REGULAR FOAM. FOR LARGER FIRES, USE WATER SPRAY, FOG OR REGULAR

FOAM.

Fire Fighting Procedures:USE NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP .
MOVE CONTR FROM FIRE AREA IF YOU CAN DO IT W/O RISK. DO NOT SCATTER
SPILLED MATL W/HIGH-PRESS (SUPP DATA)

Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO
HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP AND PLACE IN SUITABLE CLEAN, DRY
CONTAINERS FOR RECLAMATION OR LATER DISPOSAL. DO NOT FLUSH MATERIAL
INTO SEWER. KEEP UNNECESSARY PEOPLE AWAY.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER

===== Handling and Storage =====

Handling and Storage Precautions:NONE SPECIFIED BY MANUFACTURER

Other Precautions:AVOID BREATHING VAPORS OR DUSTS.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED
ON CONTAMINATION LEVELS FOUND IN WORK PLACE, MUST NOT EXCEED
WORKING LIMITS OF RESPIRATOR & BE JOINTLY APPROVED BY NIOSH/MSHA.
FOR ADDITIONAL 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:APPROP PROT CLTHG/EQUIP TO PVNT RPTD/PRLNG
SKIN CONT. EYE WASH FOUNTAIN WITHIN IMMEDIATE WORK AREA FOR
EMERGENCY USE.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER

Supplemental Safety and Health

BP: 1202F(650C) DECOMPOSES. MP: 392F(200C) SLIGHT DECOMPOSITION. FIRE
FIGHT PROC: WATER STREAM. DIKE FIRE-CTL WATER FOR LATER DISPOS.
EFTS OF OVEREXP: STOOLS. IN SEV CASES, LIVER/KIDNEY DMG W/SEV ANEM
IA MAY OCCUR W/SOMNOLENCE & COMA. DEATHMAY OCCUR FROM CIRCULATORY
FAILURE. GREENISH DISCOLORATION OF SKIN/HAIR (ING 2)

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:SUPP DATA

Melt/Freeze Pt:M.P/F.P Text:SUPP DATA

Spec Gravity:3.6

Solubility in Water:14.3% @ 0C

Appearance and Odor:GRAYISH-WHITE TO GREENISH-WHITE RHOMBIC CRYSTALS.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

AVOID CONTACT W/STRONG OXIDIZERS. INCOMPATIBLE WITH HYDROXYLAMINE,
MAGNESIUM, SODIUM HYPOBROMITE.

Stability Condition to Avoid:MAY BURN BUT DOES NOT IGNITE READILY.
AVOID EXCESSIVE HEAT, SPARKS, OR OPEN FLAME.

Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE
TOXIC SO*X.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL,
STATE, AND LOCAL REGULATIONS . REPORTABLE QTY: 10 POUNDS.

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particular situation.

WARD'S NATURAL SCIENCE ESTABLISHMENT INC. -- CUPROUS CHLORIDE,37 W
2273 -- 6810-00D006805

=====
Product Identification
=====

Product ID:CUPROUS CHLORIDE,37 W 2273
MSDS Date:08/11/1995
FSC:6810
NIIN:00D006805
MSDS Number: CDYTJ
=== Responsible Party ===
Company Name:WARD'S NATURAL SCIENCE ESTABLISHMENT INC.
Box:92912
City:ROCHESTER
State:NY
ZIP:14692-9012
Country:US
Info Phone Num:716-359-2502
Emergency Phone Num:716-226-6177/800-424-9300 (CHEMTREC)
Preparer's Name:MICHAEL RASZEIJA
CAGE:EO227

==== Contractor Identification ===

Company Name:WARD'S NATURAL SCIENCE ESTABLISHMENT INC.
Box:92912
City:ROCHESTER
State:NY
ZIP:14692-9012
Country:US
Phone:716-359-2502
CAGE:EO227
Company Name:WARDS NATURAL SCIENCE ESTABLISHMENT INC
Address:5100 W HENRIETTA RD
Box:92912
City:ROCHESTER
State:NY
ZIP:14692-9012
Country:US
Phone:(716) 359-2502
CAGE:63759

=====
Composition/Information on Ingredients
=====

Ingred Name:COPPER CHLORIDE
CAS:7758-89-6
RTECS #:GL6990000
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL, RAT) IS 265 MG/KG.
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:EYES, SKIN, RESPIRATORY
& GI TRACTS. ACUTE- INHALE:IRRITATING TO UPPER RESPIRATORY TRACT.
MAY CAUSE NASAL CONGESTION. EYES:CORROSIVE, CAUSES CONJUNCTIVITIS.
SKIN:MAY CAUSE ALLERGIC SKIN REACTION. ORAL:TOXIC. MAY CAUSE

COPPER POISONING AND/OR DEATH. CHRONIC- UNKNOWN.

Explanation of Carcinogenicity:NONE

Effects of Overexposure:IRRITATION, CHILLS, PAIN, NAUSEA, VOMITING,
METALLIC TASTE, DIARRHEA, REDNESS, ALLERGIC SKIN REACTION

Medical Cond Aggravated by Exposure:PERSONS WITH PRE-EXISTING SKIN
DISORDERS, EYE PROBLEMS, IMPAIRED RESPIRATORY FUNCTION OR PERSONS
WITH WILSON'S DISEASE MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF
THIS PRODUCT.

=====
===== First Aid Measures =====

First Aid:GET MEDICAL HELP IF SYMPTOMS PERSIST. INHALED:REMOVE TO FRESH
AIR. PROVIDE CPR/OXYGEN IF NEEDED. EYES:FLUSH WITH WATER FOR 15
MINUTES. HOLD EYELIDS OPEN. SKIN:WASH WITH SOAP & WATER. ORAL:DO
NOT INDUCE VOMITING. IF CONSCIOUS, DRINK 2 GLASSES OF MILK/WATER.
SEEK IMMEDIATE MEDICAL ATTENTION. IF VOMITING OCCURS, KEEP HEAD
BELOW HIPS. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

=====
===== Fire Fighting Measures =====

Flash Point:NOT RELEVANT

Lower Limits:NOT RELEVANT

Upper Limits:NOT RELEVANT

Extinguishing Media:WATER SPRAY, CARBON DIOXIDE, FOAM OR DRY CHEMICAL
FOR SURROUNDING FIRE. USE WATER SPRAY TO COOL FIRE EXPOSED
CONTAINERS.

Fire Fighting Procedures:WEAR PROTECTIVE CLOTHING AND NIOSH-APPROVED
SELF-CONTAINED BREATHING APPARATUS. SEE 1993 EMERGENCY RESPONSE
GUIDEBOOK, DOT P 5800.5, GUIDE NO 60.

Unusual Fire/Explosion Hazard:MAY EMIT HAZARDOUS MATERIALS.

=====
===== Accidental Release Measures =====

Spill Release Procedures:SPRINKLE LIME OR SODA ASH ON SPILL TO FORM
INSOLUBLE COPPER SALT. SWEEP, SCOOP OR PICK UP. DO NOT RAISE DUST.
PLACE IN A SUITABLE CONTAINER FOR DISPOSAL.

Neutralizing Agent:SODA ASH, LIME

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE MATERIAL IN A DRY, VENTILATED
AREA AWAY FROM INCOMPATIBLES. KEEP CONTAINER TIGHTLY CLOSED.
PROTECT AGAINST PHYSICAL DAMAGE.

Other Precautions:DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. AVOID
INHALATION OF DUSTS. KEEP OUT OF REACH OF CHILDREN. OBEY HAZARD
WARNING LABEL. FOR LABORATORY USE ONLY. NOT FOR DRUG,
FOOD/HOUSEHOLD USE. USE WITH ADEQUATE VENTILATION.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE NORMALLY REQUIRED. IN DUSTY CONDITIONS OR
FOR SYMPTOMS OF OVER EXPOSURE, WEAR NIOSH-APPROVED DUST RESPIRATOR
OR MASK.

Ventilation:USE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP FUME OR
DUST LEVELS AS LOW AS POSSIBLE.

Protective Gloves:RUBBER/PLASTIC

Eye Protection:DUST-RESISTANT SAFETY GOGGLES

Other Protective Equipment:EYE WASH STATION, EMERGENCY SHOWER,
APPROPRIATE LABORATORY COAT TO COVER EXPOSED SKIN
Work Hygienic Practices:OBSERVE GOOD INDUSTRIAL HYGIENE PRACTICES AND
RECOMMENDED PROCEDURES. WASH THOROUGHLY BEFORE EATING,
DRINKING/SMOKING.
Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:C1
NRC/State Lic Num:NOT RELEVANT
Boiling Pt:B.P. Text:2490F,1366C
Melt/Freeze Pt:M.P/F.P Text:792F,422C
Spec Gravity:4.14
Viscosity:NOT RELEVANT
Evaporation Rate & Reference:NOT RELEVANT
Solubility in Water:0.0062% @ 20C/68F
Appearance and Odor:TAN TO GRAYISH POWDER - ODORLESS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, POTASSIUM
Stability Condition to Avoid:MOISTURE, SUNLIGHT
Hazardous Decomposition Products:TOXIC COPPER DUST, FUMES OR CHLORINE
GAS

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND
FEDERAL REGULATIONS. CONTACT AN APPROVED/LICENSED DISPOSAL AGENCY.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Cyclohexane

ACC# 96004

Section 1 - Chemical Product and Company Identification

MSDS Name: Cyclohexane

Catalog Numbers: AC111110000, AC111110010, AC111110025, AC111110050, AC111110100, AC111110250 AC111110250, AC167740000, AC167740010, AC167740025, AC167745000, AC176810000 AC176810000, AC176810010, AC176810025, AC176810050, AC176810250, AC176815000 AC176815000, AC210570000, AC210570010, AC210570025, AC279590000, AC279590010 AC279590010, AC279590025, AC326590000, AC326590010, AC326590025, AC326830000 AC326830000, AC326831000, AC364660000, AC364660010, AC364661000, AC406020000 AC406020000, AC406025000

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
110-82-7	Cyclohexane	>99%	203-806-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available. Appearance: colorless clear liquid. Flash Point: -18 deg C.

Not available.

Target Organs: Kidneys, central nervous system, liver, respiratory system, cardiovascular system, skin.

Potential Health Effects

Eye: May cause mild eye irritation.

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

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May cause liver and 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. May cause vascular collapse and damage. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. May cause lung damage.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause respiratory tract irritation. May be fatal if exposed to high concentrations. Inhalation of vapors may cause drowsiness and dizziness.

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. Do NOT allow victim to rub eyes or keep eyes closed.

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: Do not induce vomiting. Possible aspiration hazard. 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.

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. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Extremely flammable. Material will readily ignite at room temperature. Use water spray to keep fire-exposed containers cool. May form explosive peroxides.

Extinguishing Media: Use foam, dry chemical, or carbon dioxide. Water may be ineffective. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained.

Flash Point: -18 deg C (-0.40 deg F)

Autoignition Temperature: 260 deg C (500.00 deg F)

Explosion Limits, Lower: 1.2 Vol %

Upper: 8.4 Vol %

NFPA Rating: (estimated) Health: 1; Flammability: 3; 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. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Scoop up with a nonsparking tool, then place into a suitable container for disposal. Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Use spark-proof tools and explosion proof equipment. Do not reuse this container. Avoid breathing dust, mist, or vapor. Avoid contact with skin and eyes. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. May form explosive peroxides on prolonged storage.

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
Cyclohexane	100 ppm TWA	300 ppm TWA; 1050 mg/m ³ TWA 1300 ppm IDLH	300 ppm TWA; 1050 mg/m ³ TWA

OSHA Vacated PELs: Cyclohexane: 300 ppm TWA; 1050 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear neoprene gloves, apron, and/or clothing. Wear nitrile-latex gloves, apron, and/or clothing.

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: colorless
Odor: chloroform-like - sweetish odor
pH: Not available.
Vapor Pressure: 104mbar @20 deg C
Vapor Density: 0.7786 at 68F.
Evaporation Rate:6.1 (Butyl acetate=1)
Viscosity: 0.94 mPa s @20 deg C
Boiling Point: 81 deg C @760mmHg
Freezing/Melting Point:6.5 deg C
Decomposition Temperature:Not available.
Solubility: Negligible.
Specific Gravity/Density:0.770
Molecular Formula:C6H12
Molecular Weight:84.15

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, ignition sources.
Incompatibilities with Other Materials: Strong oxidizing agents, oxidizing agents, dinitrogen tetraoxide.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 110-82-7: GU6300000
LD50/LC50:
CAS# 110-82-7:
Draize test, rabbit, skin: 1548 mg/2D (Intermittent);
Inhalation, mouse: LC50 = 70000 mg/m³/2H;
Oral, mouse: LD50 = 813 mg/kg;
Oral, rat: LD50 = 12705 mg/kg;

Carcinogenicity:
CAS# 110-82-7: 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. 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# 110-82-7: waste number U056 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CYCLOHEXANE	CYCLOHEXANE
Hazard Class:	3	3
UN Number:	UN1145	UN1145
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 110-82-7 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 110-82-7: Effective 12/19/85, Sunset 12/19/95

Chemical Test Rules

CAS# 110-82-7: 40 CFR 799.5000

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# 110-82-7: 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 # 110-82-7: immediate, delayed, fire.

Section 313

This material contains Cyclohexane (CAS# 110-82-7, >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:

CAS# 110-82-7 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# 110-82-7 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 F N

Risk Phrases:

R 11 Highly flammable.

R 38 Irritating to skin.

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

R 65 Harmful: may cause lung damage if swallowed.

R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 25 Avoid contact with eyes.

- S 33 Take precautionary measures against static discharges.
- S 9 Keep container in a well-ventilated place.
- 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.
- S 62 If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 110-82-7: 1

Canada - DSL/NDSL

CAS# 110-82-7 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# 110-82-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cyclohexanol

ACC# 05880

Section 1 - Chemical Product and Company Identification

MSDS Name: Cyclohexanol

Catalog Numbers: S79991, C558 500, C558-500, C558500

Synonyms: Adronal; Cyclohexyl alcohol; Hexalin; Hexahydrophenol; Hydroxycyclohexane.

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
108-93-0	Cyclohexanol	100	203-630-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless or slight yellow liquid. Flash Point: 67 deg C.

Caution! Combustible liquid and vapor. May be harmful if swallowed or absorbed through the skin. May cause eye and skin irritation. May cause respiratory tract irritation. May cause central nervous system depression. Hygroscopic (absorbs moisture from the air).
Target Organs: Central nervous system, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. May cause chemical conjunctivitis and corneal damage.

Skin: Causes skin irritation. May cause irritation and dermatitis. May cause cyanosis of the extremities.

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.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Aspiration may lead to pulmonary edema. Inhalation at high concentrations may cause CNS depression and asphyxiation.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. Effects may be delayed. Prolonged exposure may cause non-specific nervous system 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. 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: 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. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Containers may explode in the heat of a fire. Combustible liquid. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated.

Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: 67 deg C (152.60 deg F)

Autoignition Temperature: 300 deg C (572.00 deg F)

Explosion Limits, Lower:Not available.

Upper: N/A

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: 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. Do not flush into a sewer. Clean up spills immediately, observing precautions in the Protective Equipment section. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Use a spark-proof tool. 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. 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 tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. 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
Cyclohexanol	50 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	50 ppm TWA; 200 mg/m ³ TWA 400 ppm IDLH	50 ppm TWA; 200 mg/m ³ TWA

OSHA Vacated PELs: Cyclohexanol: 50 ppm TWA; 200 mg/m³ TWA

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: Liquid

Appearance: colorless or slight yellow

Odor: camphor or menthol odor.

pH: Not available.

Vapor Pressure: 80 mm Hg @ 25 deg C

Vapor Density: 3.5 (Air=1)

Evaporation Rate:0.08 (n-butyl acetate=1)

Viscosity: 4.6 mPa @ 25 deg C

Boiling Point: 161 deg C @ 760mm Hg

Freezing/Melting Point:23 deg C

Decomposition Temperature:Not available.

Solubility: 3.6g/100ml (20°C)

Specific Gravity/Density: .96g/cm³

Molecular Formula:C₆H₁₂O

Molecular Weight:100.16

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, moisture, excess heat.

Incompatibilities with Other Materials: Oxidizing agents

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, toxic gases.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 108-93-0: GV7875000

LD50/LC50:

CAS# 108-93-0:

Draize test, rabbit, eye: 100 uL/24H Moderate;

Draize test, rabbit, eye: 100 uL/24H Mild;

Draize test, rabbit, eye: 10 uL Moderate;

Draize test, rabbit, skin: 500 uL/24H Moderate;

Draize test, rabbit, skin: 500 uL/24H Mild;

Oral, rat: LD50 = 1400 mg/kg;

Carcinogenicity:

CAS# 108-93-0: 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: 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: Will not bioconcentrate, highly mobile in soil.

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:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 108-93-0 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

CAS# 108-93-0: Testing required by manufacturers, processors

Section 12b

CAS# 108-93-0: Section 4

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 # 108-93-0: immediate, delayed, fire.

Section 313

This material contains Cyclohexanol (CAS# 108-93-0, 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# 108-93-0 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

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 37/38 Irritating to respiratory system and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 108-93-0: 1

Canada - DSL/NDSL

CAS# 108-93-0 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# 108-93-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cyclohexanone

ACC# 05890

Section 1 - Chemical Product and Company Identification

MSDS Name: Cyclohexanone

Catalog Numbers: AC111190000, AC111190250, AC111190251, AC406095000, 11119-0010, 11119-0025, C550-4, NC9335342, NC9449331, NC9619559, O2109-1, O2109-4, O2109-4LC, O2109FB-115, O2109FB-19, O2109FB-200, O2109FB-50, O2109POP-19, O2109POP-200, O2109POP-50, O2109POPB-20, O2109POPB-50, O2109RB-200, O2109RB-50, O2109RS-19, O2109SS-115, O2109SS-19, O2109SS-200, O2109SS-28, O2109SS-50

Synonyms: Ketoexamethylene; Pimelic ketone.

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
108-94-1	Cyclohexanone	98+	203-631-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: APHA: 10 max liquid. Flash Point: 46 deg C.

Warning! Possible cancer hazard. May cause cancer based on animal data. **Flammable liquid and vapor.** Harmful if inhaled. Causes eye and skin irritation. May cause respiratory tract irritation. May cause central nervous system effects.

Target Organs: Blood, kidneys, central nervous system, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Undiluted cyclohexanone placed in the eyes of rabbits caused marked irritation and some corneal injury.

Skin: Causes skin irritation. May be harmful if absorbed through the skin. Cyclohexanone was not a sensitizer in the guinea pig maximization test and the mouse ear swelling test. There has been one case report of sensitization to cyclohexanone itself in a patient using a PVC adhesive composed of 100% cyclohexanone; patch testing confirmed the sensitization.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed. May cause central nervous system effects.

Inhalation: Harmful if inhaled. May cause respiratory tract irritation. May cause central nervous system effects. Cyclohexanone has caused damage to the liver and kidneys in rabbits exposed by inhalation to an airborne concentration of 190 ppm.

Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause dermatitis. 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.

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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Containers may explode in the heat of a fire. Flammable liquid and vapor.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use foam, dry chemical, or carbon dioxide. Water may be ineffective.

Flash Point: 46 deg C (114.80 deg F)

Autoignition Temperature: 520 deg C (968.00 deg F)

Explosion Limits, Lower: 1.10 vol %

Upper: 8.10 vol %

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: 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). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Take precautionary measures against static discharges. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Flammables-area.

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 only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cyclohexanone	20 ppm TWA; 50 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route	25 ppm TWA; 100 mg/m ³ TWA 700 ppm IDLH	50 ppm TWA; 200 mg/m ³ TWA

OSHA Vacated PELs: Cyclohexanone: 25 ppm TWA; 100 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: Liquid

Appearance: clear, colorless - APHA: 10 max

Odor: none reported

pH: Not applicable.

Vapor Pressure: 4.5 mbar @ 20 deg C

Vapor Density: 3.4 (air=1)

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 155 deg C @ 760 mmHg

Freezing/Melting Point:-47 deg C

Decomposition Temperature:Not available.

Solubility: Slightly soluble.

Specific Gravity/Density:0.947

Molecular Formula:C6H10O

Molecular Weight:98.14

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat.

Incompatibilities with Other Materials: Reducing agents, plastics.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 108-94-1: GW1050000

LD50/LC50:

CAS# 108-94-1:

Draize test, rabbit, eye: 20 mg Severe;

Draize test, rabbit, eye: 250 ug/24H Severe;

Inhalation, mouse: LC50 = 2375 mg/m³;

Inhalation, rat: LC50 = 8000 ppm/4H;

Inhalation, rat: LC50 = 19000 mg/m³;

Oral, mouse: LD50 = 1400 mg/kg;

Oral, rat: LD50 = 1620 uL/kg;

Oral, rat: LD50 = 1800 mg/kg;

Skin, rabbit: LD50 = 1 mL/kg;

Carcinogenicity:

CAS# 108-94-1:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: 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:** Mutation in microorganisms: See actual entry in RTECS for complete information.**Neurotoxicity:** No information found**Other Studies:**

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 90.0 mg/L; 96 Hr.; 320.0 mg/L CaCO₃ Fish: Rainbow trout: LC50 = 44.0 mg/L; 96 Hr.; 20.0 mg/L CaCO₃ Fish: Fathead Minnow: LC50 = 527.0 mg/L; 96 Hr.; Flow-through, 24-26 degrees C, pH 7.5 Water flea Daphnia: EC50 = 820.0 mg/L; 48 Hr.; Unspecified Algae: EC50 = 20.0 mg/L; 96 Hr.; Unspecified Bacteria: Phytobacterium phosphoreum: EC50 = 18.7 mg/L; 5 minutes; Microtox Test No data available.**Environmental:** This chemical is expected to rapidly volatilize based on its low melting and boiling point. Cyclohexanone is estimated to be highly mobile in soil. In view of its moderate vapor pressure and low adsorption to soil, it would be expected to volatilize from surface soil. Although data are lacking, it may also undergo direct photolysis on the soil surface. Cyclohexanone is readily biodegradable according to aerobic screening tests and therefore would be expected to biodegrade in soil.**Physical:** No information found.**Other:** The bioconcentration factor (BCF) for cyclohexanone can be estimated to be 2.4 based on the log K_{ow} of 0.81 and a recommended regression equation. This BCF indicates that cyclohexanone will not bioconcentrate in aquatic organisms.

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# 108-94-1: waste number U057 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CYCLOHEXANONE	CYCLOHEXANONE
Hazard Class:	3	3
UN Number:	UN1915	UN1915
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 108-94-1 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 108-94-1: 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# 108-94-1: 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 # 108-94-1: 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# 108-94-1 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:**

XN

Risk Phrases:

R 10 Flammable.

R 20 Harmful by inhalation.

Safety Phrases:

S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 108-94-1: 1

Canada - DSL/NDSL

CAS# 108-94-1 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# 108-94-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Cyclooctanone, 98%

ACC# 53847

Section 1 - Chemical Product and Company Identification

MSDS Name: Cyclooctanone, 98%

Catalog Numbers: AC111440000, AC111441000

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
502-49-8	Cyclooctanone, 98%	98%	207-940-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white solid. Flash Point: 74 deg C.

Caution! Combustible liquid and vapor. 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: 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.

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. Will burn if involved in a fire.

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

Flash Point: 74 deg C (165.20 deg F)

Autoignition Temperature: 320 deg C (608.00 deg F)

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. Scoop up with a nonsparking tool, then place into a suitable container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Use spark-proof tools and explosion proof equipment. Avoid breathing dust, mist, or vapor. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cyclooctanone, 98%	none listed	none listed	none listed

OSHA Vacated PELs: Cyclooctanone, 98%: 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 white

Odor: Not available.

pH: Not available.

Vapor Pressure: .3 hPa @ 20 C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 195 - 197 deg C @ 760.00mm Hg

Freezing/Melting Point: 39 - 41 deg C

Decomposition Temperature: Not available.

Solubility: 15G/L (20°C)

Specific Gravity/Density: .9580g/cm³

Molecular Formula: C₈H₁₄O

Molecular Weight: 126.20

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, mechanical shock, incompatible materials, ignition sources, excess heat, temperatures above 75°C (167°F).

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, and reducing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 502-49-8: GX9800000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 502-49-8: 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:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 502-49-8 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# 502-49-8 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# 502-49-8: 1

Canada - DSL/NDSL

CAS# 502-49-8 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

Cyclopentanone

ACC# 66717

Section 1 - Chemical Product and Company Identification

MSDS Name: Cyclopentanone

Catalog Numbers: AC111530000, AC111530010, AC1115319, AC111532500, NC9055031, NC9196412

Synonyms: Ketocyclopentane.

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
120-92-3	Cyclopentanone	99+	204-435-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear colorless to slightly yellow liquid. Flash Point: 26 deg C.

Danger! Flammable liquid and vapor. 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.

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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Containers may explode in the heat of a fire. Flammable liquid and vapor.

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

Flash Point: 26 deg C (78.80 deg F)

Autoignition Temperature: 430 deg C (806.00 deg F)

Explosion Limits, Lower: 1.3 Vol %

Upper: 10.8 Vol %

NFPA Rating: (estimated) Health: 2; Flammability: 3; 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. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Use spark-proof tools and explosion proof

equipment. Do not get in eyes, on skin, or on clothing. Keep away from heat, sparks and flame. Avoid ingestion and inhalation.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Flammables-area.

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
Cyclopentanone	none listed	none listed	none listed

OSHA Vacated PELs: Cyclopentanone: 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 slightly yellow

Odor: ethereal odor

pH: Not available.

Vapor Pressure: < 200 mbar @ 50 deg C

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: 1.29 mPa @ 20 deg C

Boiling Point: 130 - 131 deg C @ 760 mmHg

Freezing/Melting Point:-51 deg C

Decomposition Temperature:Not available.

Solubility: Negligible.

Specific Gravity/Density:0.950

Molecular Formula:C₅H₈O

Molecular Weight:84.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, acids, strong bases, hydrazine, hydroxylamine, hydrogen peroxide, hydrazine derivatives, polymerizing initiators, nitric acid.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 120-92-3: GY4725000

LD50/LC50:

CAS# 120-92-3:

Draize test, rabbit, eye: 100 mg Severe;

Draize test, rabbit, skin: 500 mg/24H;

Draize test, rabbit, skin: 500 mg Mild;

Inhalation, rat: LC50 = 19500 mg/m³;

Oral, mouse: LD50 = 1820 mg/kg;

Carcinogenicity:

CAS# 120-92-3: 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. EC50 Daphnia magna 1440 mg/l Toxicity threshold: Scenedesmus quadricauda 370 mg/l; Entosiphon sulcatum 545 mg/l

Environmental: Cyclopentanone is not expected to undergo hydrolysis or photolysis in the environment. Limited data suggests that cyclopentanone should biodegrade rapidly upon acclimation in soil and water.

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:	CYCLOPENTANONE	CYCLOPENTANONE
Hazard Class:	3	3
UN Number:	UN2245	UN2245
Packing Group:	III	III
Additional Info:		FLASHPOINT 30 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 120-92-3 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 # 120-92-3: 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# 120-92-3 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:**

XI

Risk Phrases:

R 10 Flammable.

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

WGK (Water Danger/Protection)

CAS# 120-92-3: 1

Canada - DSL/NDSL

CAS# 120-92-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, 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

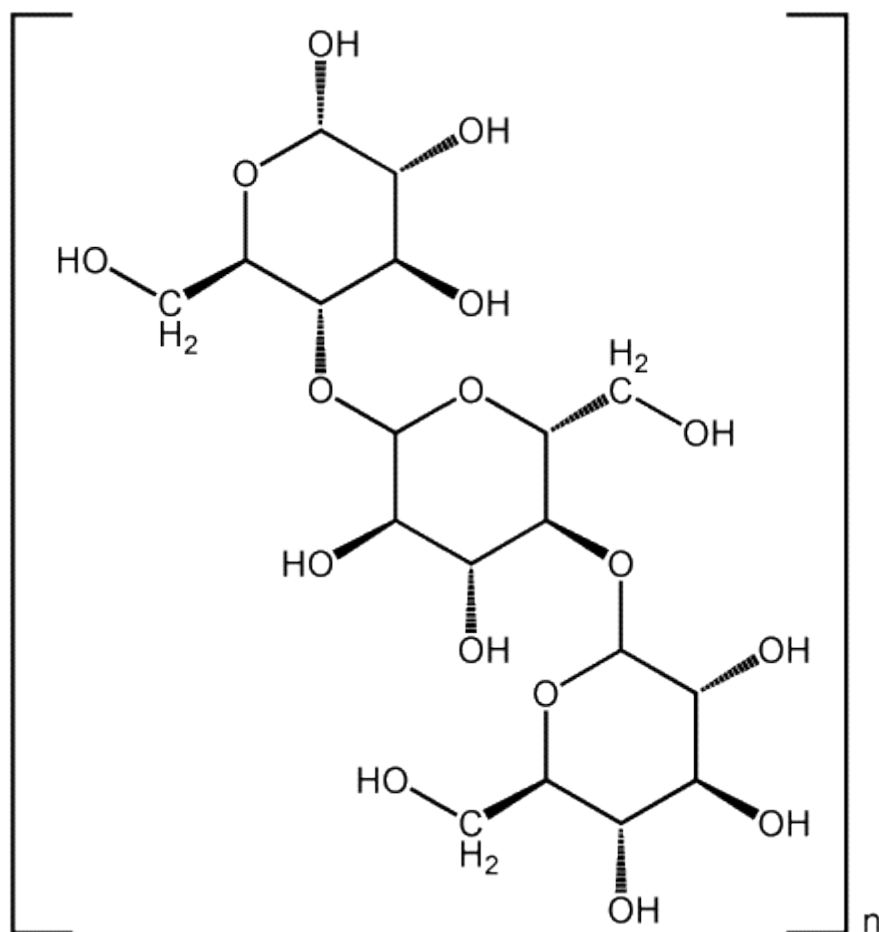
Dextrin

- Starch gum
- Dextrins
- Tapioca dextrin
- Pinedex
- Cream Dextrin 15
- (3R,4S,5S,6R)-2-[(2R,3S,4R,5R)-4,5-Dihydroxy-2-(hydroxymethyl)-6-[(2R,3S,4R,5R,6S)-4,5,6-trihydroxy-2-(hydroxymethyl)oxan-3-yl]oxyoxan-3-yl]oxyoxan-3-yl]oxy-6-(hydroxymethyl)oxane-3,4,5-triol

Formula

Polymer

Structure



Description

White to off-white solid.

Uses

Excipient for dry extracts and pills.

Registry Numbers and Inventories.

CAS	9004-53-9
NIH PubChem CID	3987 (SID)
EC (EINECS/ELINCS)	232-675-4

RTECS	HH9450000
RTECS class	Other
Beilstein/Gmelin	NA
EPA OPP	84503
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Vapor density (air=1) 5.6

Hazards and Protection.

Storage	Store in a cool, dry place. Keep container closed when not in use. Store protected from moisture.
Handling	Wash thoroughly after handling. Wash hands before eating. Avoid contact with skin and eyes. Avoid ingestion and inhalation. 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	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Provide ventilation. Do not get water inside containers.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizers.
Decomposition	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. 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.

Health.

Exposure effects

Ingestion	Ingestion of large amounts may cause gastrointestinal irritation.
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. Get medical aid.

Material Safety Data Sheet

Dimethylglyoxime, 99+%

ACC# 96030

Section 1 - Chemical Product and Company Identification

MSDS Name: Dimethylglyoxime, 99+%

Catalog Numbers: AC172000000, AC172001000, AC172005000

Synonyms: 2,3-Butanedione dioxime; Diacetyl dioxime; 2,3-Diisonitrosobutane; Biacetyl, dioxime; Glyoxime, dimethyl-

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
95-45-4	Dimethylglyoxime	99+	202-420-1

Hazard Symbols: XN

Risk Phrases: 22

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white powder. The toxicological properties of this material have not been fully investigated. **Caution!** May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May be harmful if swallowed.

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. May be harmful if swallowed.

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

Chronic: Prolonged or repeated skin contact may cause dermatitis. 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: 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: 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 to cool fire-exposed containers. 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. 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. Avoid breathing dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep away from heat and flame. 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
Dimethylglyoxime	none listed	none listed	none listed

OSHA Vacated PELs: Dimethylglyoxime: 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: Powder

Appearance: white to off-white

Odor: Perceptible odor.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point:240 - 241 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble.
Specific Gravity/Density:Not available.
Molecular Formula:C4H8N2O2
Molecular Weight:116.12

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, dust generation, temperatures above 90°C.
Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, strong acids.
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# 95-45-4: EK2975000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 95-45-4: 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: Oncogenic transformation: Hamster embryo = 100 ug/L.
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# 95-45-4 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 TPQ.

SARA Codes

CAS # 95-45-4: 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# 95-45-4 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:**

XN

Risk Phrases:

R 22 Harmful 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# 95-45-4: No information available.

Canada - DSL/NDSL

CAS# 95-45-4 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

Canadian Ingredient Disclosure List**Exposure Limits**

Material Safety Data Sheet

Diphenylthiocarbazone

ACC# 08145

Section 1 - Chemical Product and Company Identification

MSDS Name: Diphenylthiocarbazone

Catalog Numbers: D90 10, D90-10, D9010, S79999

Synonyms: Phenyl diazenecarbothioic acid 2-phenylhydrazide; Dithizone

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
60-10-6	Diazenecarbothioic acid, phenyl-,2-phenylhydrazide	100	200-454-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: blue-black solid.

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

Target Organs: None.

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.

Inhalation: May cause respiratory tract irritation.

Chronic: Compound chelates metal. When administered to animals, this material induces diabetes.

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: 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. 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. Use water spray to cool fire-exposed containers.

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: 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 general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Diazenecarbothioic acid, phenyl-,2-phenylhydrazide	none listed	none listed	none listed

OSHA Vacated PELs: Diazenecarbothioic acid, phenyl-,2-phenylhydrazide: 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: blue-black

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: 168 deg C

Decomposition Temperature: Not available.

Solubility: insoluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: C₁₃H₁₂N₄S
Molecular Weight: 256.1708

Section 10 - Stability and Reactivity

Chemical Stability: Materials containing similar functional groups can decompose at elevated temperatures.

Conditions to Avoid: Incompatible materials.

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# 60-10-6: LQ9450000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 60-10-6: 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# 60-10-6 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 # 60-10-6: 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# 60-10-6 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 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# 60-10-6: No information available.

Canada - DSL/NDSL

CAS# 60-10-6 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

Material Safety Data Sheet

DL-Tryptophan

ACC# 97831

Section 1 - Chemical Product and Company Identification

MSDS Name: DL-Tryptophan

Catalog Numbers: AC172110000, AC172110250, AC172110500, AC172111000, AC172112500

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
54-12-6	DL-Tryptophan	99	200-194-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light beige 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 appropriate 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-Tryptophan	none listed	none listed	none listed

OSHA Vacated PELs: DL-Tryptophan: 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 beige

Odor: odorless

pH: 5.5 - 7.0 (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: 289 - 290 deg C (decom)

Decomposition Temperature: > 240 deg C

Solubility: 10 g/L (20°C)

Specific Gravity/Density: Not available.

Molecular Formula: C₁₁H₁₂N₂O₂

Molecular Weight: 204.23

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# 54-12-6: YN6129200

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 54-12-6: 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# 54-12-6 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.

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# 54-12-6 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# 54-12-6: 0

Canada - DSL/NDSL

CAS# 54-12-6 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

Ethyl acetate

ACC# 08750

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethyl acetate

Catalog Numbers: AC149470000, AC149470010, AC149470025, AC149470050, AC149470100, AC149470250, AC167810000, AC167810010, AC167810025, AC167815000, AC232110000, AC232110010, AC232110025, AC232110050, AC232110051, AC232110250, AC232110251, AC268350000, AC268350010, AC268350025, AC268350040, AC296790000, AC326610000, AC326610010, AC326610025, AC326900000, AC326901000, AC326902500, AC327880000, AC327880010, AC364240000, AC364350000, AC364350010, AC364350025, AC364351000, AC423170000, AC423175000, AC423680000, AC423680010, AC423680040, AC423685000, AC610060040, AC610170040, AC610341000, S75118, S80003, S80004, S93229, S93229A, S93230, S93230A, BP1125-1, BP1125-4, E124-20, E124-4, E124RS-200, E124RS200, E145-1, E145-20, E145-200, E145-4, E145-500, E1454LC, E145FB115, E145FB19, E145FB200, E145FB50, E145POP-50, E145POP50, E145POPB-50, E145POPB50, E145RB-200, E145RB-50, E145RB115, E145RB19, E145RB200, E145RB50, E145RS-115, E145RS-50, E145RS115, E145RS28, E145RS50, E145S-4, E145SK-4, E145SS-200, E145SS115, E145SS1350, E145SS200, E145SS28, E145SS50, E189-4, E191-4, E195-1, E195-4, E195N1-19, E195N119, E195N2-19, E195N219, E195RS-200, E195RS115, E195RS200, E195RS50, E195SK-1, E195SK-4, E195SS-50, E195SS115, E195SS19, E195SS50, E196-4, E196-4LC, E196RS115, E196RS28, E196SK-4, E196SS-200, E196SS115, E196SS200, E196SS28, E196SS50, E1984LC, E95NB219, E95SS19, NC9173149, NC9234722, NC9406405, NC9728400, 23-005-51, 23-005-68

Synonyms: Acetic acid, ethyl ester; Acetic ether; Acetidin; Acetoxyethane; Ethyl acetic ester; Ethyl ethanoate; Vinegar naphtha.

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
141-78-6	Ethyl acetate	>99	205-500-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: -4 deg C.

Warning! Flammable liquid and vapor. Causes eye irritation. Breathing vapors may cause drowsiness and dizziness. May cause respiratory tract irritation. Prolonged or repeated contact causes defatting of the skin with irritation, dryness, and cracking.

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

Potential Health Effects

Eye: Causes eye irritation. Vapors may cause eye irritation.

Skin: May cause skin irritation. Repeated or prolonged exposure may cause drying and cracking of the skin. The majority of human studies have demonstrated that ethyl acetate does not cause an allergic response on human skin. However, there is one case report of a woman developing a skin allergy to ethyl acetate.

Ingestion: May cause irritation of the digestive tract. Ingestion of large amounts may cause central nervous depression. May cause headache, nausea, fatigue, and dizziness. These effects may be caused in part by ethanol which is released when ethyl acetate is broken down in the body.

Inhalation: May cause respiratory tract irritation. Inhalation of high concentrations may cause narcotic effects. May be harmful if inhaled.

Chronic: Chronic inhalation may cause effects similar to those of acute inhalation. Animals exposed to 4300 ppm (mice) and 2000 ppm (guinea pig), 6 hours/day for 7 days developed minor blood changes & loss of appetite. There was no indication of liver or kidney injury. Rabbits exposed to 16000 mg/m³ (4440 ppm), 1 hour/day for 40 days developed secondary anemia (decreased number of red blood cells), decreased hemoglobin levels, increased numbers of macrophages, congestion and fatty degeneration of various organs, and enlargement of the spleen. A reviewer suggested that the organ damage may have been due to impurities present in the ethyl

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. Vapors may form an explosive mixture with air. 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. Flammable 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: Water may be ineffective. Use water spray, alcohol foam, CO₂, dry chemical.

Flash Point: -4 deg C (24.80 deg F)

Autoignition Temperature: 426 deg C (798.80 deg F)

Explosion Limits, Lower:2.0

Upper: 11.5

NFPA Rating: (estimated) Health: 1; Flammability: 3; 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. Remove all sources of ignition. Provide ventilation. Use only non-sparking tools and equipment.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid breathing vapor or mist.

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. Flammables-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 explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethyl acetate	400 ppm TWA	400 ppm TWA; 1400 mg/m ³ TWA 2000 ppm IDLH	400 ppm TWA; 1400 mg/m ³ TWA

OSHA Vacated PELs: Ethyl acetate: 400 ppm TWA; 1400 mg/m³ TWA

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: Liquid

Appearance: clear, colorless

Odor: sweet, fruity odor

pH: Not available.

Vapor Pressure: 73 mm Hg @ 20 deg C

Vapor Density: 3.04 (Air=1)

Evaporation Rate:6.2 (Butyl acetate=1)

Viscosity: 0.44 cps @ 25 deg C

Boiling Point: 77 deg C

Freezing/Melting Point:-83 deg C

Decomposition Temperature:Not available.

Solubility: Slightly soluble.

Specific Gravity/Density:0.9 (Water=1)

Molecular Formula:C₄H₈O₂

Molecular Weight:88.11

Section 10 - Stability and Reactivity

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

Conditions to Avoid: Ignition sources, moisture, excess heat, attacks some plastics,

rubber, and coatings, confined spaces.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, strong bases.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, ethyl alcohol, acetic acid.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 141-78-6: AH5425000

LD50/LC50:

CAS# 141-78-6:

Inhalation, mouse: LC50 = 45 gm/m³/2H;

Inhalation, rat: LC50 = 200 gm/m³;

Oral, mouse: LD50 = 4100 mg/kg;

Oral, rabbit: LD50 = 4935 mg/kg;

Oral, rat: LD50 = 5620 mg/kg;

Skin, rabbit: LD50 = >20 mL/kg;

Carcinogenicity:

CAS# 141-78-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Cytogenetic Analysis: hamster fibroblast 9g/L Sex Chromosome Loss/Non-disjunction: *S. cerevisiae* 24400 ppm.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 230mg/L; 96H; Daphnid LC50=2500 mg/L/96H Golden orfe LC50=270 mg/L/48H

Environmental: Terrestrial: Expected to have high mobility in soil. Volatilization of ethyl acetate from moist soil surfaces is expected to be important. Aquatic: Not expected to adsorb to suspended solids and sediment in water. Atmospheric: Expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase ethyl acetate is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 10 days.

Physical: Substance biodegrades at a high rate with little bioconcentration.

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:

CAS# 141-78-6: waste number U112 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ETHYL ACETATE	ETHYL ACETATE
Hazard Class:	3	3
UN Number:	UN1173	UN1173
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 141-78-6 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

CAS# 141-78-6: 40 CFR 799.5000

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# 141-78-6: 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 # 141-78-6: 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 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# 141-78-6 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 F

Risk Phrases:

R 11 Highly flammable.

R 36 Irritating to eyes.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

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

S 33 Take precautionary measures against static discharges.

WGK (Water Danger/Protection)

CAS# 141-78-6: 1

Canada - DSL/NDSL

CAS# 141-78-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2.

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# 141-78-6 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Ethylbenzene

ACC# 00596

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethylbenzene

Catalog Numbers: AC118080000, AC118080025, AC118080250, AC118080251, AC118085000, 11808-0010, O2751-1

Synonyms: Ethylbenzol; Phenylethane.

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
100-41-4	Ethylbenzene	>99	202-849-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 15 deg C.

Warning! Flammable liquid and vapor. Causes eye, skin, and respiratory tract irritation. May be harmful if inhaled. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause central nervous system depression.

Target Organs: Central nervous system.

Potential Health Effects

Eye: Causes severe eye irritation. Causes redness and pain.

Skin: Causes skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis. May be absorbed through the skin. Causes redness and pain.

Ingestion: May cause irritation of the digestive tract. May cause 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. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Vapors may cause dizziness or suffocation.

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

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: 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. Use water spray to keep fire-exposed containers cool. Flammable 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. This liquid floats on water and may travel to a source of ignition and spread fire. May accumulate static electricity.

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

Flash Point: 15 deg C (59.00 deg F)

Autoignition Temperature: 432 deg C (809.60 deg F)

Explosion Limits, Lower:1.2%

Upper: 6.8%

NFPA Rating: (estimated) Health: 2; Flammability: 3; 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. Control runoff and isolate discharged material for proper disposal. Use water spray to cool and disperse vapors and protect personnel.

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. 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. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Avoid breathing vapor or mist.
Storage: Keep away from sources of ignition. 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 general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethylbenzene	100 ppm TWA; 125 ppm STEL	100 ppm TWA; 435 mg/m ³ TWA 800 ppm IDLH	100 ppm TWA; 435 mg/m ³ TWA

OSHA Vacated PELs: Ethylbenzene: 100 ppm TWA; 435 mg/m³ TWA

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: Liquid
Appearance: clear, colorless
Odor: aromatic odor
pH: Not available.
Vapor Pressure: 9.6 mm Hg @ 25 deg C
Vapor Density: 3.7 (air=1)
Evaporation Rate:<1 (butyl acetate=1)
Viscosity: 0.63 mPa s 20 C
Boiling Point: 136 deg C
Freezing/Melting Point:-95 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble.
Specific Gravity/Density:0.86
Molecular Formula:C₈H₁₀
Molecular Weight:106.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Ignition sources, excess heat.
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# 100-41-4: DA0700000

LD50/LC50:

CAS# 100-41-4:

Draize test, rabbit, eye: 500 mg Severe;
Inhalation, mouse: LC50 = 35500 mg/m³/2H;
Inhalation, rat: LC50 = 55000 mg/m³/2H;
Oral, rat: LD50 = 3500 mg/kg;
Oral, rat: LD50 = 3500 mg/kg;
Skin, rabbit: LD50 = 17800 uL/kg;

Inhalation rat LC50: 17.2 mg/l/4H from BASF.

Carcinogenicity:

CAS# 100-41-4:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 6/11/04

- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in mammalian somatic cells(Rodent,mouse) Lymphocyte = 80 mg/L.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 14.0 mg/L; 96 Hr.; Static Bioassay Fish: Fathead Minnow: LC50 = 12.1 mg/L; 96 Hr.; Flow-through Bioassay Fish: Bluegill/Sunfish: LC50 = 150.0 mg/L; 96 Hr.; Static Bioassay, pH 6.5-7.9, 21-23 degrees C Water flea EC50 = 2.1 mg/L; 48 Hr.; Static Bioassay Water flea EC50 = 75.0 mg/L; 48 Hr.; Static Bioassay Shrimp (mysidopsis bahia), LC50=87.6 mg/L/96hr. Sheepshead minnow LC50=275 mg/L/96hr. Fathead minnow LC50=42.3 mg/L/96hr in hard water & 48.5 mg/L/96hr in softwater.

Environmental: Experimental data on the bioconcentration of ethylbenzene include a log BCF of 1.9 in goldfish and the log BCF of 0.67 for clams exposed to the water-soluble fraction of crude oil. Using its octanol/water partition coefficient (log Kow= 3.15) and using a recommended regression equation, one can calculate a log BCF in fish of 2.16 indicating that ethylbenzene should not significantly bioconcentrate in aquatic organisms.

Ethylbenzene has a moderate adsorption for soil. The measured Koc for silt loam was 164

Physical: The predominant photochemical reaction of ethylbenzene in the atmosphere is with hydroxyl radicals; the tropospheric half-life for this reaction is 5.5 and 24 hr in the summer and winter, actively. Degradation is somewhat faster under photochemical smog situations. Photooxidation products which have been identified include ethylphenol, benzaldehyde, acetophenone and m- and p-ethylnitrobenzene. Ethylbenzene is resistant to hydrolysis. Ethylbenzene does not significantly absorb light above 290 nm in methanol solution.

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:	ETHYLBENZENE	ETHYLBENZENE
Hazard Class:	3	3
UN Number:	UN1175	UN1175
Packing Group:	II	II
Additional Info:		FLASHPOINT 15 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 100-41-4 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 100-41-4: Effective 6/19/87, Sunset 6/19/97

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# 100-41-4: 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 # 100-41-4: immediate, delayed, fire.

Section 313

This material contains Ethylbenzene (CAS# 100-41-4, >99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 100-41-4 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# 100-41-4 is listed as a Hazardous Substance under the CWA. CAS# 100-41-4 is listed as a Priority Pollutant under the Clean Water Act. CAS# 100-41-4 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# 100-41-4 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 Ethylbenzene, 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 F

Risk Phrases:

R 11 Highly flammable.
R 20 Harmful by inhalation.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 24/25 Avoid contact with skin and eyes.
S 29 Do not empty into drains.

WGK (Water Danger/Protection)

CAS# 100-41-4: 1

Canada - DSL/NDSL

CAS# 100-41-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, 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

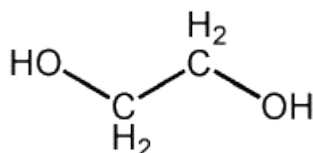
CAS# 100-41-4 is listed on the Canadian Ingredient Disclosure List.

Ethylene glycol

- 1,2-Ethanediol
- Ethane-1,2-diol
- Monoethylene glycol

Formula HOCH₂CH₂OH

Structure



Description Clear, colorless, syrupy liquid, hygroscopic.

Uses Automotive antifreeze, solvent, adjuvant.

Registry Numbers and Inventories.

CAS	107-21-1
NIH PubChem CID	174
EC (EINECS/ELINCS)	203-473-3
EC Index Number	603-027-00-1
EC Class	Xn; R22
RTECS	KW2975000
RTECS class	Agricultural Chemical and Pesticide; Tumorigen; Mutagen; Reproductive Effector; Human Data; Primary Irritant
Merck	13,3832
Beilstein/Gmelin	505945
Beilstein Reference	4-01-00-02369
EPA OPP	42203
Swiss Giftliste 1	G-1177
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed
Israel	Listed

Properties.

Formula	C ₂ H ₆ O ₂
Formula mass	62.07
Melting point, °C	-13
Boiling point, °C	195
Decomposition point, °C	451
Vapor pressure, mm_{Hg}	0.06 (20 C)
Vapor density (air=1)	2.6
Saturation Concentration	66 ppm at 20 C
Evaporization number	600 (diethyl ether = 1)
Odor threshold	Odorless
Critical temperature	446
Critical pressure	80.9
Density	1.115 g/cm ³ (20 C)
Solubility in water	Miscible
Viscosity	26 cp @ 15C
Surface tension	48.4 g/s ² @ 20 C
Refractive index	1.43312 (20 C)
Dipole moment	2.28 D (20 C)
Dielectric constant	37.7 (25 C)
Partition coefficient, pK_{ow}	-1.36
Heat of fusion	11.2 kJ/mol
Heat of vaporization	50.5 kJ/mol
Heat of combustion	-1036 kJ/mol

Hazards and Protection.

Storage	Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances.
<u>WHMIS</u>	D2A
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Avoid contact with skin and eyes. Avoid ingestion and inhalation.
Protection	Wear appropriate eye protection and protective clothing to prevent skin and eye contact.
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. Remove all sources of ignition. Provide ventilation.

Stability

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

Incompatibilities

Chlorosulfonic acid, dimethyl terephthalate, oleum, phosphorus pentasulfide, silvered-copper wire, sodium hydroxide, sulfuric acid, titanium butoxide. Causes ignition at room temperature with chromium trioxide, potassium permanganate, and sodium peroxide. Causes ignition at 100 C with ammonium dichromate, silver chlorate, sodium chloride, and uranyl nitrate.

Decomposition

Carbon dioxide and carbon monoxide may form when heated to decomposition. May produce acrid smoke and irritating fumes when heated to decomposition.

Fire.

Flash Point, °C

111

Autoignition, °C

398

Upper exp. limit, %

15.3

Lower exp. limit, %

3.2

Fire fighting

Wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Extinguish using dry chemical, foam or carbon dioxide. Water or foam may cause frothing. Water spray may be used to extinguish surrounding fire and cool exposed containers. Water spray will also reduce fume and irritant gases.

Fire potential

This chemical is combustible.

Combustion products

Toxic gases and vapors may be released if involved in a fire.

NFPA

Health

1

Flammability

1

Reactivity

0

Health.

Exposure limit(s)

TLV: 50 ppm; 127 mg/m³ as CEILING (ACGIH 1993-1994). NIOSH REL: See Appendix D

Poison_Class

4

Exposure effects

Repeated small exposures by any route can cause severe kidney problems. Brain damage may also occur. Skin allergy can develop. May damage the developing fetus.

Ingestion

Initial symptoms in massive dosage parallel alcohol intoxication, progressing to CNS depression, vomiting, headache, rapid respiratory and heart rate, lowered blood pressure, stupor, collapse, and unconsciousness with convulsions. Death from respiratory arrest or cardiovascular collapse may follow. Lethal dose in humans: 100 ml.

Inhalation Vapor inhalation is generally not a problem unless heated or misted. Exposure to vapors over an extended time period has caused throat irritation and headache. May cause nausea, vomiting, dizziness and drowsiness. Pulmonary edema and central nervous system depression may also develop. When heated or misted, has produced rapid, involuntary eye movement and coma.

Skin May cause skin irritation. Low hazard for usual industrial handling.

Eyes Splashes may cause irritation, pain, 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 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 First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

Transportation.

USCG CHRIS Code	EGL
USCG Compatability Group	20 Alcohols, Glycols
HS Code	2905 31 00
Std. Transport #	4960196
IMO Pollution Category	D

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Material Safety Data Sheet

Ferric Ammonium Sulfate

ACC# 91793

Section 1 - Chemical Product and Company Identification

MSDS Name: Ferric Ammonium Sulfate

Catalog Numbers: S75122

Synonyms: Iron Ammonium Sulfate;

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
10138-04-2	Ferric Ammonium Sulfate	ca. 100	233-382-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: violet crystals.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause cardiac disturbances. May cause liver and kidney damage. 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. Based upon known information concerning inorganic iron-containing substances, may cause digestive tract irritation and damage,

cardiovascular abnormalities, liver/kidney changes, and cerebral swelling.

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 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. 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: 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. 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
Ferric Ammonium Sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Ferric 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 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: violet

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 230 deg C
Freezing/Melting Point:39-41 deg C
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:Not available.
Molecular Formula:FeNH4SO4
Molecular Weight:169.9393

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: Oxides of nitrogen, oxides of sulfur, irritating and toxic fumes and gases, ammonia and/or derivatives.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 10138-04-2 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 10138-04-2: 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

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# 10138-04-2 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 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# 10138-04-2 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:

WGK (Water Danger/Protection)

CAS# 10138-04-2: No information available.

Canada - DSL/NDSL

CAS# 10138-04-2 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

CAS# 10138-04-2 is not listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC, CHEMICAL DIV. -- FERRIC CHLORIDE,HEXAHYDRATE -- 6810-00-241-1164

=====
Product Identification
=====

Product ID:FERRIC CHLORIDE,HEXAHYDRATE
MSDS Date:04/29/1992
FSC:6810
NIIN:00-241-1164
MSDS Number: BJPRN
=== 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
=====

Ingrid Name:FERRIC CHLORIDE HEXAHYDRATE
CAS:10025-77-1
RTECS #:NO5425000
Fraction by Wt: 100%
Other REC Limits:NONE SPECIFIED
OSHA PEL:1 MG/M3 (FE)
ACGIH TLV:1 MG/M3 (FE)

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 ORAL RAT 1872 MG/KG (ANHYDROUS)
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: SEVERE EYE, SKIN AND MUCOUS
MEMBRANE IRRITANT. POISONING MAY AFFECT THE DIGESTIVE TRACT,
RESPIRATORY, CARDIOVASCULAR AND CENTRAL NERVOUS SYSTEMS, LIVER AND
KIDNEYS. CHRONIC: MUCOUS MEMBRANE IRR ITATION, HEMOSIDEROSIS WITH
POSSIBLE DAMAGE TO LIVER AND PANCREAS.
Effects of Overexposure:EYES: REDNESS, PAIN, BLURRED VISION, BURNS.
SKIN: IRRITATION, PAIN, BURNS. INHALATION: SEVERE RESPIRATORY TRACT
IRRITATION, SORE THROAT, COUGH, LABORED BREATHING. INGESTION:
ABDOMINAL PAIN, VOMITING, DIARRHEA, INTENSE DEHYDRATION, SHOCK,
PALLOR, CYANOSIS, WEAK PULSE, RAPID RESPIRATION, ACIDOSIS,
DROWSINESS, COMA, DEATH
Medical Cond Aggravated by Exposure:INDIVIDUALS WITH A HISTORY OF EYES,

SKIN OR RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.

=====
===== First Aid Measures =====

First Aid:EYES: FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MIN. THEN FLUSH WITH SALINE SOLN FOR 30-60 MIN. SEE DOCTOR. SKIN: WASH WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MIN. SEE DOCTOR. INHALATION: REMOVE TO FRESH AREA. GIVE OXYGEN/CPR IF NEEDED. SEE DOCTOR. INGESTION: INDUCE VOMITING. SEE DOCTOR. FOLLOW WITH GASTRIC LAVAGE WITH DEROXAMINE AND SODIUM BICARBONATE UNDER DOCTOR'S SUPERVISION.

=====
===== Fire Fighting Measures =====

Extinguishing Media:USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Fire Fighting Procedures:MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT SAFELY. COOL FIRE EXPOSED CONTAINERS WITH WATER UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM ENDS OF TANK.
Unusual Fire/Explosion Hazard:MAY BURN, BUT DOES NOT IGNITE READILY. FLAMMABLE, POISONOUS GASES MAY ACCUMULATE IN TANKS AND HOPPER CARS. MAY IGNITE COMBUSTIBLES (WOOD, PAPER, OIL, ETC.)

=====
===== Accidental Release Measures =====

Spill Release Procedures:WITH CLEAN SHOVEL PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN COOL, DRY, WELL VENTILATED AREA, AWAY FROM INCOMPATIBLE MATERIALS. AVOID ANY PHYSICAL CONTACT. KEEP CONTAINERS TIGHTLY CLOSED.
Other Precautions:PERIODIC MEDICAL EXAMINATIONS ARE RECOMMENDED FOR INDIVIDUALS REGULARLY EXPOSED TO DUST OR MIST.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH/MSHA-APPROVED RESPIRATOR WITH DUST CARTRIDGE OR SELF CONTAINED BREATHING APPARATUS FOR THE EXPOSURE OF CONCERN IF TLV IS EXCEEDED.
Ventilation:LOCAL EXHAUST AND/OR GENERAL DILUTION VENTILATION TO MAINTAIN EXPOSURE LEVEL BELOW TLV.
Protective Gloves:PROTECTIVE GLOVES.
Eye Protection:DUST RESISTANT GOGGLES AND FACESHIELD.
Other Protective Equipment:IMPERVIOUS CLOTHING TO PREVENT SKIN CONTACT. EYE WASH STATION AND SAFETY SHOWER.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Safety and Health
CORROSIVE MATERIAL. AVOID CONTACT.

=====
===== Physical/Chemical Properties =====

HCC:C1
Boiling Pt:B.P. Text:536F,280C

Melt/Freeze Pt:M.P/F.P Text:99.0F,37.2C
Spec Gravity:1.82
pH:2,0.1M
Solubility in Water:91.9%
Appearance and Odor:BROWNISH-YELLOW OR ORANGE, VERY DELIQUESCENT,
MONOCLYNIC CRYSTALS, HCL ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
SODIUM, POTASSIUM, ALLYL CHLORIDE, ETHYLENE OXIDE, AROMATIC MONOMERS,
METALS, WOOD, PAPER, OIL.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:TOXIC AND CORROSIVE FUMES OF CHLORINE.
Conditions to Avoid Polymerization:FERRIC CHLORIDE MAY CATALYZE
POLYMERIZATION OF ALLYL CHLORIDE, ETHYLENE OXIDE, OR OTHER VARIOUS
AROMATIC MONOMERS.

===== Disposal Considerations =====

Waste Disposal Methods:NOTIFY YOUR LOCAL ENVIRONMENTAL OFFICER. KEEP IN
COVERED CONTAINERS PENDING DISPOSAL. DISPOSE OF IN ACCORDANCE WITH
FEDERAL, STATE AND LOCAL REGULATIONS. EPA HAZARDOUS WASTE NUMBER
D002.

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assume responsibility for the suitability of this information to their
particular situation.

FISHER SCIENTIFIC, CHEMICAL DIV. -- FERROUS AMMONIUM SULFATE
HEXAHYDRATE -- 6810-00-275-8143

=====
Product Identification
=====

Product ID:FERROUS AMMONIUM SULFATE HEXAHYDRATE
MSDS Date:12/30/1992
FSC:6810
NIIN:00-275-8143
MSDS Number: BMDQC
=== 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
Emergency Phone Num:201-796-7100 OR 201-796-7523
CAGE:1B464

==== Contractor Identification ====

Company Name:DYNATECH SCIENTIFIC INC
Address:1401 27TH ST
Box:640164
City:KENNER
State:LA
ZIP:70064
Country:US
Phone:504-465-9604
CAGE:0VL27
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:AMMONIUM IRON(II) SULFATE HEXAHYDRATE
CAS:7783-85-9
RTECS #:BR6500000
Fraction by Wt: 100%
Other REC Limits:NONE SPECIFIED

=====
Hazards Identification
=====

Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHALATION: INHALATION OF DUST MAY
IRRITATE NOSE AND THROAT AND CAUSE DYSPNEA. SOLUBLE IRON SALTS MAY
BE ABSORBED. SKIN: MAY CAUSE IRRITATION. EYES: DUST OR MIST MAY
IRRITATE THE EYES OR CAUSE BURNS .INGESTION: ABDOMINAL IRRITATION
AND POSSIBLE CENTRAL NERVOUS SYSTEM DEPRESSION.
Effects of Overexposure:INHALATION: IRRITATION. SKIN: DERMATITIS AND

IRRITATION. EYES: LATE EYE DEGENERATION HAS BEEN REPORTED IN RABBITS. INGESTION: ABDOMINAL PAIN, RETCHING AND PROLONGED VOMITING. DIARRHEA, INTENSE DEHYDRATION, SHOCK, PALLOR, COMA AND EVEN DEATH.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
===== First Aid Measures =====

First Aid:INHALATION: REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. ASSIST WITH BREATHING SUPPORT MEASURES IF NEEDED. SKIN: WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS. EYES: WASH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR 15-20 MIN. INGESTION: GIVE 2-4 GLASSES OF WATER. INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.

=====
===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM. Fire Fighting Procedures:MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. DO NOT SCATTER SPILLED MATERIAL WITH MORE WATER THAN NEEDED FOR FIRE CONTROL. DIKE FIRE CONTROL WATER. Unusual Fire/Explosion Hazard:AVOID BREATHING HAZARDOUS VAPORS OR DUSTS, KEEP UPWIND.

=====
===== Accidental Release Measures =====

Spill Release Procedures:NEUTRALIZE THE MATERIAL. DIG HOLDING AREA FOR CONTAINMENT. USE PROTECTIVE COVER SUCH AS A PLASTIC SHEET TO PREVENT MATERIAL FROM DISSOLVING IN FIRE EXTINGUISHING WATER OR RAIN. STOP LEAD IF YOU CAN DO IT WITHOUT RISK. TAKE UP SMALL SPILLS WITH SAND. Neutralizing Agent:NEUTRALIZE WITH AGRICULTURAL LIME, SLAKED LIME, CRUSHED LIMESTONE, OR NAHCO3.

=====
===== Handling and Storage =====

Handling and Storage Precautions:NONE SPECIFIED BY MANUFACTURER. Other Precautions:NONE

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE A HIGH-EFFICIENCY PARTICULATE RESPIRATOR FOR HIGH LEVELS. Ventilation:PROVIDE LOCAL EXHAUST VENTILATION AND/OR GENERAL DILUTION VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS. Protective Gloves:MUST WEAR APPROPRIATE PROTECTIVE GLOVES. Eye Protection:SAFETY GLASSES OR GOGGLES. Other Protective Equipment:APPROPRIATE PROTECTIVE CLOTHING AS NEEDED. Work Hygienic Practices:WASH HANDS AFTER HANDLING THIS MATERIAL. Supplemental Safety and Health NONE

=====
===== Physical/Chemical Properties =====

HCC:N1
Boiling Pt:B.P. Text:DECOMPOSES

Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES
Decomp Temp:Decomp Text:212F,100C
Spec Gravity:1.9
Solubility in Water:26.9%
Appearance and Odor:PALE BLUE-GREEN CRYSTALS OR CRYSTALLINE POWDER.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZERS.
Stability Condition to Avoid:STABLE UNDER NORMAL TEMPERATURES AND
PRESSURES, UP TO THE BOILING POINT (100C) WHERE DECOMPOSITION
OCCURS.
Hazardous Decomposition Products:MAY RELEASE TOXIC FUMES OF AMMONIA AND
TOXIC OXIDES OF NITROGEN. ALSO POSSIBLY SULFUR TRIOXIDE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND
FEDERAL REGULATIONS.

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assume responsibility for the suitability of this information to their
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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particular situation.

Material Safety Data Sheet

Fluorene

ACC# 92820

Section 1 - Chemical Product and Company Identification

MSDS Name: Fluorene

Catalog Numbers: AC156130000, AC156130250, AC156131000, AC156135000

Synonyms: Diphenylenemethane.

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
86-73-7	Fluorene	98	201-695-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light brown crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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. 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 chemical foam.

Flash Point: 151 deg C (303.80 deg F)

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: Do not let this chemical enter the environment. Use with adequate ventilation. Minimize dust generation and accumulation. 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
Fluorene	none listed	none listed	none listed

OSHA Vacated PELs: Fluorene: 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: almost white - light brown

Odor: None reported.

pH: Not available.

Vapor Pressure: 13 hPa @ 146 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 298 deg C @ 760 mmHg

Freezing/Melting Point: 112 - 116 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 1.2

Molecular Formula: C₁₃H₁₀

Molecular Weight: 166.22

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, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 86-73-7: LL5670000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 86-73-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: See actual entry in RTECS for complete information.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Fish toxicity :LC50 (48hr) fathead minnow > 100mg/l (Finger, S.E. et al ASTM Spec. Tech. Publ. 865 1985); LC50 (24hr) bluegill sunfish, goldfish +/-5mg/l (Wood, E.M. The toxicity of 3400 chemicals to fish 1987); LC50 (unspecified exposure) himedaka killifish 3,3mg/l (Niiromi, J. et al Mie-ken Kankyo Kagaku Senta Kenkyu Hokoku 1989) Invertebrate toxicity : EC50 (48hr) Daphnia magna 0,43 mg/l (Finger, S.E. et al ASTM spec. Tech. Publ. 865 1985); LC50 (96hr) Neanthes arenacoedentata 1mg/l (Rossi, S. S. et al Mar. Pollut. Bull. 1978)

Environmental: Terrestrial: Half-life ranges from 2 to 64 days; biodegradation is the primary route of degradation in soil. Aquatic: Will adsorb strongly to sediments and suspended matter. Adsorption into sediment is an important fate process. Atmospheric: Expected to exist primarily in the vapor phase in the ambient atmosphere; will degrade readily in the ambient atmosphere by reaction with photochemically produced hydroxyl radicals (estimated half-life of about 29 hr).

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	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL
Hazard Class:	9	9
UN Number:	UN3077	UN3077
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 86-73-7 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# 86-73-7: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

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. CAS# 86-73-7 is listed as a Priority Pollutant under the Clean Water Act.

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# 86-73-7 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:

N

Risk Phrases:

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

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

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# 86-73-7: No information available.

Canada - DSL/NDSL

CAS# 86-73-7 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# 86-73-7 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Xanthan gum

ACC# 02672

Section 1 - Chemical Product and Company Identification

MSDS Name: Xanthan gum

Catalog Numbers: AC291370000

Synonyms: Polysaccharide gum; Water-soluble bipolymer made by fermentation of carbohydrates.

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
11138-66-2	Xanthan gum	100	234-394-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown powder.

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: Dust may cause mechanical irritation. Low hazard for usual industrial handling.

Ingestion: No hazard expected in normal industrial use.

Inhalation: 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. If irritation develops, get medical aid.

Skin: Get medical aid if irritation develops or persists. No specific treatment is necessary, since this material is not likely to be hazardous.

Ingestion: Wash mouth out with water. No specific treatment is necessary, since this material is expected to be non-hazardous.

Inhalation: Remove from exposure and move to fresh air immediately.

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 chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: > 200 deg C (> 392.00 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: Vacuum or sweep up material and place into a suitable disposal container. Forms smooth, slippery surfaces on floors, posing an accident risk. 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 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
Xanthan gum	none listed	none listed	none listed

OSHA Vacated PELs: Xanthan 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: 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: Powder

Appearance: white to light yellow - brown

Odor: mild odor - bland

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: 2000 cps (1% aq soln)

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: > 10,000,000

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

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

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 11138-66-2 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 11138-66-2: 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

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Biodegradable.

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# 11138-66-2 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# 11138-66-2 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# 11138-66-2: 1

Canada - DSL/NDSL

CAS# 11138-66-2 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

Hexanes

ACC# 10950

Section 1 - Chemical Product and Company Identification

MSDS Name: Hexanes

Catalog Numbers: AC130340000, H300-4, H302-1, H302-4, H302J-4, H302N1-19, H302N2-19, H302NB219, H302POP19, H302POP200, H302POP50, H302POP19, H302RS-115, H302RS-19, H302RS-200, H302RS-28, H302RS-50, H302SK-1, H302SK-4, H302SS19, H302SS200, H303-1, H303-4, H303J-4, H303J1, H303POP19, H303POP200, H303POP50, H303RS-115, H303RS-19, H303RS-200, H303RS-50, H303RS28, H303SS-115, H303SS-200, H303SS-28, H303SS-30, H303SS-50, H303SS19, H307-4, H334-1, H334-4, NC9693916, NC9851780, NC9878676, S80032HPLC

Synonyms: n-Hexane; Hexyl hydride; Dipropyl; normal-Hexane; Hex.

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
110-54-3	Hexane	>80.0	203-777-6
96-14-0	3-Methylpentane	>2.0	202-481-4
96-37-7	Methylcyclopentane	>2.0	202-503-2

Hazard Symbols: XN F N

Risk Phrases: 11 38 48/20 62 51/53 65 67

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear colorless liquid. Flash Point: -22 deg C. Aspiration hazard if swallowed. Can enter lungs and cause damage. Causes respiratory tract irritation. Causes eye and skin

irritation. **Danger!** Extremely flammable liquid and vapor. Vapor may cause flash fire. Possible risk of impaired fertility. Breathing vapors may cause drowsiness and dizziness. Dangerous for the environment. May cause nervous system effects.

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

Potential Health Effects

Eye: Causes mild eye irritation. Causes redness and pain. May cause blurred vision, tearing, and conjunctivitis.

Skin: Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. Causes irritation with burning pain, itching, and redness. Absorbed through the skin.

Ingestion: Aspiration hazard. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. May cause central nervous system effects. Aspiration can cause asphyxia, brain damage, and cardiac arrest.

Inhalation: Causes respiratory tract irritation. Exposure produces central nervous system depression. Aspiration may cause respiratory swelling and pneumonitis. Inhalation of high concentrations may cause narcotic effects. Vapors may cause dizziness or suffocation. Exposure may cause vertigo, hallucinations, fatigue, muscle weakness, visual disturbances, nervous system disturbances, coughing, chest pains, difficulty in breathing, lung irritation, gastrointestinal disturbances, and edema which may be fatal.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. Prolonged or repeated exposure may cause adverse reproductive effects. May cause fetal effects. Chronic exposure may cause visual disturbances. Laboratory experiments have resulted in mutagenic effects. Peripheral neuropathy symptoms include: muscular weakness, paresthesia, numbing of the hands, feet, legs and arms, unsteadiness, and difficulty in walking and standing. Repeated exposure may cause nervous system abnormalities with muscle weakness and damage, motor incoordination, and sensation disturbances. Chronic exposure produces peripheral neuropathy.

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: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless 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. For ingestion, the stomach should be intubated, aspirated, and lavaged with a slurry of activated charcoal--protect the airway from aspiration of gastric contents. Monitor arterial blood gases in cases of severe aspiration.

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. Vapors may form an explosive mixture with air. 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. Extremely flammable liquid and vapor. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. May accumulate static electrical charges, and may cause ignition of its own vapors. Containers may explode if exposed to fire. 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: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Water may be ineffective. Water may spread fire. If water is the only media available, use in flooding amounts. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: -22 deg C (-7.60 deg F)

Autoignition Temperature: 225 deg C (437.00 deg F)

Explosion Limits, Lower: 1.1 vol %

Upper: 7.5 vol %

NFPA Rating: (estimated) Health: 1; Flammability: 3; 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. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Use only non-sparking tools and equipment.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Avoid contact with heat, sparks and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep away from heat and flame. Keep away from sources of ignition. Store in a

tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-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 explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hexane	50 ppm TWA; skin - potential for cutaneous absorption	50 ppm TWA; 180 mg/m ³ TWA 1100 ppm IDLH	500 ppm TWA; 1800 mg/m ³ TWA
3-Methylpentane	none listed	none listed	none listed
Methylcyclopentane	none listed	none listed	none listed

OSHA Vacated PELs: Hexane: 50 ppm TWA; 180 mg/m³ TWA 3-Methylpentane: No OSHA Vacated PELs are listed for this chemical. Methylcyclopentane: 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: Liquid

Appearance: clear colorless

Odor: gasoline-like

pH: Not available.

Vapor Pressure: 151 mm Hg @ 25 deg C

Vapor Density: 2.97(Air = 1)

Evaporation Rate:Not available.

Viscosity: 0.31 mPas 20 C

Boiling Point: 69 deg C @ 760 mmHg

Freezing/Melting Point:-95 deg C

Decomposition Temperature:Not available.

Solubility: Insoluble.
Specific Gravity/Density:0.6600
Molecular Formula:C6H14
Molecular Weight:86.18

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Ignition sources, excess heat, electrical sparks.
Incompatibilities with Other Materials: Dinitrogen tetroxide, strong 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# 110-54-3: MN9275000

CAS# 96-14-0 unlisted.

CAS# 96-37-7: GY4640000

LD50/LC50:

CAS# 110-54-3:

Draize test, rabbit, eye: 10 mg Mild;

Inhalation, rat: LC50 = 48000 ppm/4H;

Oral, rat: LD50 = 25 gm/kg;<BR.

CAS# 96-14-0:<BR.

CAS# 96-37-7:<BR.

Carcinogenicity:

CAS# 110-54-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 96-14-0: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 96-37-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: Effects on Newborn - behavioral: Inhalation, rat: TCLo = 10000 ppm/7H (female 15 days pre-mating and female 1-18 days after conception).; Effects on Embryo or Fetus - fetotoxicity: Inhalation, rat: TCLo = 5000 ppm/20 H (female 6-19 days after conception).

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: Sex Chromosome Loss and Nondisjunction: Saccharomyces cerevisiae = 132 mmol/L.; Cytogenetic Analysis: Hamster fibroblast = 500 mg/L.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: No data available. Estimated BCF values = 2.24 and 2.89. These values suggest that hexane will show low bioconcentration in aquatic organisms. Estimated Koc value = 4.11. This product will show slight soil mobility and is expected to rapidly volatilize from moist surface soils.

Environmental: Terrestrial: Volatilization and adsorption are expected to be the most important fate processes. Aquatic: Photolysis or hydrolysis are not expected to be important. Atmospheric: Expected to exist entirely in the vapor phase in ambient air, expected half life 2.8 days. Expected to biodegrade but not 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	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	HEXANES				No information available.
Hazard Class:	3				
UN Number:	UN1208				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 110-54-3 is listed on the TSCA inventory.

CAS# 96-14-0 is listed on the TSCA inventory.

CAS# 96-37-7 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 96-37-7: Effective Date: 6/20/85; Sunset Date: 11/9/93

Chemical Test Rules

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

Section 12b

CAS# 96-37-7: 4/12b

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# 110-54-3: 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 # 110-54-3: acute, chronic, flammable. CAS # 96-14-0: acute, flammable. CAS # 96-37-7: flammable.

Section 313

This material contains Hexane (CAS# 110-54-3, 80 0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 110-54-3 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# 110-54-3 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 96-14-0 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

CAS# 96-37-7 can be found on the following state right to know lists: 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:**

XN F N

Risk Phrases:

R 11 Highly flammable.

R 38 Irritating to skin.

R 48/20 Harmful : danger of serious damage to health by prolonged exposure through inhalation.

R 62 Possible risk of impaired fertility.
R 51/53 Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.
R 65 Harmful: may cause lung damage if swallowed.
R 67 Vapors may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 29 Do not empty into drains.
S 33 Take precautionary measures against static discharges.
S 36/37 Wear suitable protective clothing and gloves.
S 9 Keep container in a well-ventilated place.
S 61 Avoid release to the environment. Refer to special instructions/Safety data sheets.
S 62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 110-54-3: 1

CAS# 96-14-0: 1

CAS# 96-37-7: 1

Canada - DSL/NDSL

CAS# 110-54-3 is listed on Canada's DSL List.

CAS# 96-14-0 is listed on Canada's DSL List.

CAS# 96-37-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2A.

Canadian Ingredient Disclosure List

CAS# 110-54-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 110-54-3: OEL-AUSTRALIA:TWA 50 ppm (180 mg/m³) OEL-BELGIUM:TWA 50 ppm (176 mg/m³) OEL-DENMARK:TWA 50 ppm (180 mg/m³) OEL-FINLAND:TWA 50 ppm (180 mg/m³);STEL 150 ppm (530 mg/m³) OEL-FRANCE:TWA 50 ppm (170 mg/m³) OEL-GERMANY:TWA 50 ppm (180 mg/m³) OEL-HUNGARY:TWA 100 mg/m³;STEL 200 mg/m³;Skin OEL-JAPAN:TWA 40 ppm (140 mg/m³);Skin OEL-THE NETHERLANDS:TWA 100 ppm (360 mg/m³) OEL-THE PHILIPPINES:TWA 500 ppm (1800 mg/m³) JAN9 OEL-POLAND:TWA 400 mg/m³ OEL-RUSSIA:TWA 40 ppm;STEL 300 mg/m³ OEL-SWEDEN:TWA 25 ppm (90 mg/m³);STEL 50 ppm (180 mg/m³) OEL-SWITZERLAND:TWA 50 ppm (180 mg/m³);STEL 100 ppm (360 mg/m³) OEL-TURKEY:TWA 500 ppm (1800 mg/m³) OEL-UNITED KINGDOM:TWA 100 ppm (360 mg/m³);STEL 125 ppm OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Material Safety Data Sheet

Hydrazine hydrate, 100% (Hydrazine, 64%)

ACC# 11041

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrazine hydrate, 100% (Hydrazine, 64%)

Catalog Numbers: AC196710000, AC196710050, AC196711000, AC196715000, O3109-500

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
302-01-2	Hydrazine	64	206-114-9
7732-18-5	Water	36	231-791-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: 75 deg C.

Danger! Toxic if swallowed, inhaled or absorbed through the skin. Causes eye and skin burns. Corrosive. May cause allergic skin reaction. May be absorbed through intact skin.

Combustible liquid and vapor. Cancer suspect agent. May cause blood abnormalities. May cause severe respiratory and digestive tract irritation with possible burns. May cause liver and kidney damage. Air sensitive. Very toxic to aquatic organisms. May cause reproductive and fetal effects.

Target Organs: Blood, kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns. Effects may be delayed. May cause temporary blindness. May cause visual impairment.

Skin: Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Toxic in contact with skin. Substance is readily absorbed through the skin.

Ingestion: Poison by ingestion. May cause liver and kidney damage. Causes digestive tract burns with immediate pain, swelling of the throat, convulsions, and possible coma. Exposure may cause anemia and other blood abnormalities.

Inhalation: Effects may be delayed. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). May cause liver and kidney damage. Causes chemical burns to the respiratory tract. May cause lung damage. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Toxic if inhaled. Inhalation may produce burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. May cause respiratory sensitization.

Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated exposure may cause adverse reproductive effects. Repeated inhalation may cause chronic bronchitis. May cause fetal effects. Repeated exposure may cause sensitization dermatitis. Tumorigenic Data has been reported in a mouse study with skin

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. Discard contaminated clothing in a manner which limits further exposure.

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: 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. Containers may explode when heated. Powerful reducing agent.

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.

Flash Point: 75 deg C (167.00 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:3.5%

Upper: 99.99%

NFPA Rating: (estimated) Health: 4; Flammability: 2; Instability: 3

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. 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. Use a spark-proof tool. Provide ventilation. Place under an inert atmosphere.

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. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. 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.

Storage: Keep away from sources of ignition. Do not store in direct sunlight. Store in a tightly closed container. Corrosives area. 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. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hydrazine	0.01 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	50 ppm IDLH	1 ppm TWA; 1.3 mg/m ³ TWA
Water	none listed	none listed	none listed

Hydrazine monohydrate	none listed	none listed	none listed
Hydrazine hydrate	none listed	none listed	none listed

OSHA Vacated PELs: Hydrazine: 0.1 ppm TWA; 0.1 mg/m³ TWA Water: No OSHA Vacated PELs are listed for this chemical. Hydrazine monohydrate: No OSHA Vacated PELs are listed for this chemical. Hydrazine hydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles and face shield.

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: colorless

Odor: strong odor - ammonia-like

pH: Strong Base

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 118 deg C

Freezing/Melting Point: -51.7 deg C

Decomposition Temperature: Not available.

Solubility: Miscible in water.

Specific Gravity/Density: Not available.

Molecular Formula: H₄N₂.H₂O

Molecular Weight: 50.06

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However becomes unstable if dehydrated.

Conditions to Avoid: Incompatible materials, ignition sources, exposure to air, excess heat, temperatures above 100°C.

Incompatibilities with Other Materials: Oxidizing agents, acids, alkali metals, copper, glass, halogens, iron, nitric acid, nitrites, perchlorates, sodium hydroxide, zinc, potassium, hydrogen peroxide, sodium, lead, dinitrogen tetroxide, molybdenum(IV) oxide, mercuric oxide, organic matter, metal salts, stannous chloride, 2,4-dinitrochlorobenzene, thiocyanates, rust, metal oxides.

Hazardous Decomposition Products: Nitrogen oxides, ammonia and/or derivatives,

hydrogen gas.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 302-01-2: MU7175000

CAS# 7732-18-5: ZC0110000

CAS# 7803-57-8: MV8050000

CAS# 10217-52-4: MV4590000

LD50/LC50:

CAS# 302-01-2:

Dermal, guinea pig: LD50 = 190 mg/kg;
Inhalation, mouse: LC50 = 252 ppm/4H;
Inhalation, mouse: LC50 = 1000 mg/m³/2H;
Inhalation, mouse: LC50 = 320 mg/m³/4H;
Inhalation, rat: LC50 = 570 ppm/4H;
Inhalation, rat: LC50 = 130 mg/m³/2H;
Oral, mouse: LD50 = 59 mg/kg;
Oral, mouse: LD50 = 59 mg/kg;
Oral, rat: LD50 = 60 mg/kg;
Oral, rat: LD50 = 60 mg/kg;
Skin, rabbit: LD50 = 91 mg/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 7803-57-8:

Oral, mouse: LD50 = 83 mg/kg;
Oral, rabbit: LD50 = 55 mg/kg;
Oral, rat: LD50 = 129 mg/kg;

CAS# 10217-52-4:

Inhalation, rat: LC50 = 80 mg/m³;
Oral, mouse: LD50 = 83 mg/kg;
Oral, rabbit: LD50 = 55 mg/kg;
Oral, rat: LD50 = 129 mg/kg;

Carcinogenicity:

CAS# 302-01-2:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 1/1/88
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7803-57-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 10217-52-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Mutation data has been reported.

Teratogenicity: No data available.

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. European carp: LC50 = 1.48mg/L (unknown time) Zebra fish: LC50 = 3.18mg/L (unknown time) Roach: LC50 = 0.85mg/L (unknown time)

Environmental: Substance shows moderate biological oxygen demand and it may cause some oxygen depletion in aquatic systems. It has a high potential to affect aquatic organisms. Substance is biodegradable 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:

CAS# 302-01-2: waste number U133 (Reactive waste, Toxic waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	HYDRAZINE AQUEOUS SOLUTION	HYDRAZINE, AQUEOUS SOLUTION
Hazard Class:	8	8(6.1)
UN Number:	UN2030	UN2030
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 302-01-2 is listed on the TSCA inventory.

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

CAS# 7803-57-8 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)).

CAS# 10217-52-4 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

CAS# 302-01-2: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 302-01-2: 1000 lb TPQ

SARA Codes

CAS # 302-01-2: immediate, delayed, fire, reactive.

CAS # 7803-57-8: immediate, delayed, fire, reactive.

Section 313

This material contains Hydrazine (CAS# 302-01-2, 64%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 302-01-2 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# 302-01-2 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.

CAS# 7803-57-8 can be found on the following state right to know lists: New Jersey.

CAS# 10217-52-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

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 Hydrazine, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 302-01-2: 0.04 æg/day NSRL

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T C N

Risk Phrases:

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

R 34 Causes burns.

R 43 May cause sensitization by skin contact.

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 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# 302-01-2: 3

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

CAS# 7803-57-8: 3

CAS# 10217-52-4: No information available.

Canada - DSL/NDSL

CAS# 302-01-2 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 D1A, D2A, E, B3.

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# 302-01-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Hydrofluoric acid, reagent ACS, 48.0-51.0%

ACC# 00758

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrofluoric acid, reagent ACS, 48.0-51.0%

Catalog Numbers: AC423800000, AC423800250, AC423805000

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
7732-18-5	Water	49-52%	231-791-2
7664-39-3	Hydrofluoric acid, reagent ACS		231-634-8

Hazard Symbols: T+ C

Risk Phrases: 26/27/28 35

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available. Appearance: colorless clear liquid. Not available.

Target Organs: Kidneys, liver, respiratory system, skeletal structures, eyes, skin.

Potential Health Effects

Eye: Contact with liquid or vapor causes severe burns and possible irreversible eye damage.

Skin: May be fatal if absorbed through the skin. Causes severe burns with delayed tissue destruction. Initial contact may be painless but will penetrate tissue causing severe necrosis and bone destruction.

Ingestion: Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause systemic toxic effects on the heart, liver, and kidneys. Depletes calcium levels in the body which if left untreated can lead to hypocalcemia and death.

Inhalation: May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. May cause pulmonary edema and severe

respiratory disturbances. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Depletes calcium levels in the body which if left untreated can lead to hypocalcemia and death.

Chronic: Repeated inhalation may cause chronic bronchitis. Prolonged or repeated exposure may cause permanent bone structure abnormalities.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Gently lift eyelids and flush continuously with water. Eye exposure may be treated by irrigation with 1% calcium gluconate drops after immediate and copious irrigation with water for at least 30 minutes.

Skin: Get medical aid immediately. Rinse area with large amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. For exposures to hydrofluoric acid concentrations less than 20%, liberal and frequent applications of a 2.5% calcium gluconate gel may be applied.

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.

Notes to Physician: o delayed and persistent symptoms, observe patient closely for 48 hrs. Prompt action is essential in all cases of contact.

Antidote: The use of infiltration therapy and intraarterial therapy for hydrofluoric acid burns resulting from concentrations greater than 20% should be made 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. Substance is noncombustible. Reacts with most metals to form highly flammable hydrogen gas which can form explosive mixtures with air.

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: 4; Flammability: 0; 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.

Section 7 - Handling and Storage

Handling: Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. 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: 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
Water	none listed	none listed	none listed
Hydrofluoric acid, reagent ACS	3 ppm Ceiling (as F)	3 ppm TWA; 2.5 mg/m ³ TWA 30 ppm IDLH	3 ppm TWA

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Hydrofluoric acid, reagent ACS: 3 ppm TWA (as F)

Personal Protective Equipment

Eyes: Not available.

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: Clear liquid

Appearance: colorless

Odor: strong odor - irritating odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 2.21
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 105 deg C @ 760.00mm Hg
Freezing/Melting Point: -35 deg C
Decomposition Temperature: Not available.
Solubility: soluble in water
Specific Gravity/Density: 1.1500g/cm³
Molecular Formula: HF
Molecular Weight: 20.00

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, metals.

Incompatibilities with Other Materials: Strong bases, alkali metals, fluorine, glass, cyanides (e.g. potassium cyanide, sodium cyanide), potassium permanganate, sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), carbonates.

Hazardous Decomposition Products: Fluoride fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 7664-39-3: MW7875000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg; <BR.

CAS# 7664-39-3:

Inhalation, mouse: LC50 = 5000 mg/m³/5M;

Inhalation, mouse: LC50 = 270 mg/m³/60M;

Inhalation, mouse: LC50 = 342 ppm/1H;

Inhalation, rat: LC50 = 1100 mg/m³/60M;

Inhalation, rat: LC50 = 1276 ppm/1H; <BR.

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 7664-39-3:

ACGIH: A4 - Not Classifiable as a Human Carcinogen (as F) (listed as Fluorides).

IARC: IARC Group 3 - not classifiable (listed as Fluorides, inorganic).

Epidemiology: No information available.

Teratogenicity: Embryo or fetus: death, ihl-rat TCLo:4980 ug/m³/4H (1-22 D preg).

Reproductive Effects: Fertility: post-implantation mortality and pre-implantation

mortality, ihl-rat TClO:470 ug/m3/4H.

Neurotoxicity: No data available.

Mutagenicity: dnd-dmg-ihl 1300 ppb/6Wsln-dmg-ihl 2900 ppbEPA Genetox Program 1988, Positive: D melanogaster Sex linked lethal

Other Studies: None.

Section 12 - Ecological Information

Ecotoxicity: No data available. Fish (fresh water) 60 ppm lethal (time period not specified).

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: CAS# 7664-39-3: waste number U134 (Corrosive waste, Toxic waste).

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	HYDROFLUORIC ACID				No information available.
Hazard Class:	8				
UN Number:	UN1790				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

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

CAS# 7664-39-3 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# 7664-39-3: 4a/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# 7664-39-3: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 7664-39-3: 100 lb TPQ

SARA Codes

CAS # 7664-39-3: acute, chronic.

Section 313

This chemical is not at a high enough concentration to be reportable under Section 313. No chemicals are reportable under Section 313.

Clean Air Act:

CAS# 7664-39-3 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# 7664-39-3 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# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7664-39-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, 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+ C

Risk Phrases:

R 26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.

R 35 Causes severe burns.

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.

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

S 7/9 Keep container tightly closed and in a well-ventilated place.

WGK (Water Danger/Protection)

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

CAS# 7664-39-3: 1

Canada - DSL/NDSL

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

CAS# 7664-39-3 is listed on Canada's DSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

CAS# 7664-39-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 7664-39-3: OEL-ARAB Republic of Egypt:TWA 2 ppm (2 mg/m³) OEL-AUSTRALIA:TWA 3 ppm (2.5 mg/m³) OEL-BELGIUM:STEL 3 ppm (2.6 mg/m³) OEL-CZECHOSLOVAKIA:TWA 1 mg/m³;STEL 1 mg/m³ OEL-DENMARK:TWA 2 ppm (1.6 mg/m³) OEL-FINLAND:STEL 6 ppm;Skin OEL-FRANCE:STEL 3 ppm (2.5 mg/m³) OEL-GERMANY:TWA 3 ppm (2 mg/m³) OEL-HUNGARY:TWA 0.5 mg/m³;STEL 1 mg/m³ OEL-JAPAN:TWA 3 ppm (25 mg/m³) OEL-THE NETHERLANDS:TWA 3 ppm (2 mg/m³) OEL-THE PHILIPPINES:TWA 3 ppm (2 mg/m³) OEL-POLAND:TWA 0.5 mg/m³ OEL-RUSSIA:TWA 3 ppm (0.1 mg/m³);STEL 0.5 mg/m³ OEL-SWEDEN:STEL 2 ppm (1.7 mg/m³) OEL-SWITZERLAND:TWA 1.8 ppm (1.5 mg/m³);STEL 3.6 ppm (3 mg/m³) OEL-TURKEY:TWA 3 ppm (2 mg/m³) OEL-UNITED KINGDOM:TWA 3 ppm (2.5 mg/m³);STEL 6 ppm (5 mg/m³) OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check

Material Safety Data Sheet

Hydroquinone, 99%

ACC# 96160

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydroquinone, 99%

Catalog Numbers: AC120910000, AC120910020, AC120910050, AC120915000

Synonyms: 1,4 Benzenediol; p-Hydroxybenzene; Hydroquinol; Quinol

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
123-31-9	Hydroquinone	99.0	204-617-8

Hazard Symbols: XN N

Risk Phrases: 22 40 41 43 50

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless, light tan, or light gray crystals. **Warning!** Harmful if swallowed. May cause allergic skin reaction. This substance has caused adverse reproductive and fetal effects in animals. May cause cancer based on animal studies. May cause digestive tract irritation with nausea, vomiting, and diarrhea. Light sensitive. Air sensitive. Causes eye and skin irritation. May cause respiratory tract irritation. May cause dermatitis. May cause methemoglobinemia.

Target Organs: Central nervous system, respiratory system.

Potential Health Effects

Eye: May cause eye irritation. Repeated exposure may cause corneal abnormalities including structural changes and brownish discoloration which can lead to decreased visual acuity and blindness.

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

exposure may cause hyperpigmentation of fair skin and depigmentation of dark skin.

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

Inhalation: May cause respiratory tract irritation. Causes narcotic effects including headache, dizziness, weakness, unconsciousness, and possible death. Vapors may cause dizziness or suffocation. Inhalation of dust may cause respiratory tract irritation. Exposure to high concentration of vapor may cause irritation, photophobia, tearing, and corneal ulceration.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration.

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 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 foam, dry chemical, or carbon dioxide.

Flash Point: 165 deg C (329.00 deg F)

Autoignition Temperature: 516 deg C (960.80 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: 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. 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: 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. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: colorless, light tan, or light gray

Odor: None reported.

pH: Not available.

Vapor Pressure: 1 mm Hg @ 132C

Vapor Density: 3.8 (air=1)

Evaporation Rate:Negligible.
Viscosity: Not available.
Boiling Point: 285 deg C @ 760.00mm Hg
Freezing/Melting Point:172.00 - 175.00 deg C
Decomposition Temperature:Not available.
Solubility: 70 G/L WATER (20°C)
Specific Gravity/Density:1.3280g/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 oxidizers, alkalies. Undergoes violent reaction with sodium hydroxide.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, quinone.
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;<BR.

Carcinogenicity:

CAS# 123-31-9:

ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans

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.

Neurotoxicity: No information available.

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.

Other Studies: Please refer to RTECS MX3500000 for additional information.

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	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	HYDROQUINONE				No information available.
Hazard Class:	6.1				
UN Number:	UN2662				
Packing Group:	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.

SARA**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 TPQ (lower threshold); 10000 lb TPQ (upper thres hold)

SARA Codes

CAS # 123-31-9: acute, chronic.

Section 313

This material contains Hydroquinone (CAS# 123-31-9, 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# 123-31-9 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# 123-31-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, 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:**

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

This product has a WHMIS classification of D1B, D2B.

Canadian Ingredient Disclosure List

CAS# 123-31-9 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 123-31-9: OEL-AUSTRALIA:TWA 2 mg/m³ OEL-BELGIUM:TWA 2 mg/m³ OEL-DENMARK:STEL 2 mg/m³ OEL-FINLAND:TWA 2 mg/m³;STEL 4 mg/m³;Skin OEL-FRANCE:TWA 2 mg/m³ OEL-GERMANY:TWA 2 mg/m³ OEL-THE NETHERLANDS:TWA 2 mg/m³ OEL-THE PHILIPPINES:TWA 2 mg/m³ OEL-POLAND:TWA 2 mg/m³ OEL-SWEDEN:TWA 0.5 mg/m³;STEL 1.5 mg/m³ OEL-SWITZERLAND:TWA 2 mg/m³;STEL 4 mg/m³ OEL-TURKEY:TWA 2 mg/m³ OEL-UNITED KINGDOM:TWA 2 mg/m³;STEL 4 mg/m³ OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Material Safety Data Sheet

Iodine

ACC# 11400

Section 1 - Chemical Product and Company Identification

MSDS Name: Iodine

Catalog Numbers: S75028, S750282, S75138, S75139, S93266, I35-100, I35-500, I37-100, I37-500, NC9271185, NC9272135

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
7553-56-2	Iodine	>99	231-442-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black-violet solid.

Danger! Causes burns by all exposure routes. Harmful if swallowed, inhaled, or absorbed through the skin. May cause allergic skin reaction. At ordinary temperatures, iodine sublimates to a violet gas with a characteristic, irritating odor.

Target Organs: Respiratory system, eyes, thyroid, skin.

Potential Health Effects

Eye: Causes severe eye irritation. May cause eye burns. Vapors cause eye irritation.

Skin: Harmful if absorbed through the skin. May cause severe irritation and possible burns. Rare instances of allergic reactions to topical iodine solutions characterized by fever and generalized skin eruptions have lead to death. At least one death after topical application of

a strong iodine tincture to one-third of the body has been recorded.

Ingestion: Harmful if swallowed. May cause burns to the digestive tract. Iodine is an easily oxidizable substance. Food that is present in the GI tract will oxidize iodine to iodide which is not corrosive to the GI tract.

Inhalation: Harmful if inhaled. Causes severe respiratory tract irritation. Extreme exposures could result in a build-up of fluid in the lungs (pulmonary edema) that might be fatal in severe cases. Readily sublimed having a violet vapor (Hawley's Condensed Chemical Dictionary). Inhalation of iodine vapor is intensely irritating to mucous membranes and adversely affects both the upper and lower portions of the pulmonary tract (Doc of TLV).

Chronic: 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 of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn. Chronic exposure can affect thyroid function. 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. Iodine in very small quantities is critical for proper function of the thyroid. If deficient, can cause goiter, an enlargement of the thyroid gland.

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: 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. Vapors may accumulate in confined spaces

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. 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. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. 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: 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
Iodine	0.1 ppm Ceiling	2 ppm IDLH	0.1 ppm Ceiling; 1 mg/m ³ Ceiling

OSHA Vacated PELs: Iodine: 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: black-violet
Odor: iodine-like
pH: Not available.
Vapor Pressure: 0.3 mm Hg @ 20 deg C
Vapor Density: 8.8 (air=1)
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: 184 deg C
Freezing/Melting Point:113 deg C
Decomposition Temperature:Sublimes
Solubility: 0.034 g/100 ml @ 25°C
Specific Gravity/Density:4.93
Molecular Formula:I₂
Molecular Weight:253.81

Section 10 - Stability and Reactivity

Chemical Stability: Stable. Substance is sublimable, able to go directly from solid to vapor.
Conditions to Avoid: Dust generation, excess heat.
Incompatibilities with Other Materials: Ammonia, acetylene, acetaldehyde, powdered aluminum, active metals, liquid chlorine, fluorine, carbides.
Hazardous Decomposition Products: Hydrogen iodide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7553-56-2: NN1575000
LD50/LC50:
CAS# 7553-56-2:
Oral, mouse: LD50 = 22 gm/kg;
Oral, mouse: LD50 = 1000 mg/kg;
Oral, rabbit: LD50 = 10 gm/kg;
Oral, rat: LD50 = 14 gm/kg;

Oral LDLo human: 28 mg/kg (RTECS).
Carcinogenicity:

CAS# 7553-56-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: There are many reported cases of women taking iodine-containing drugs during pregnancy and having newborns with congenital goiter, a potentially life-threatening condition for the fetus or infant.

Reproductive Effects: Reproductive effects have been reported in 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:	CORROSIVE SOLIDS, TOXIC, N.O.S.	CORROSIVE SOLID, TOXIC, N.O.S.*
Hazard Class:	8	8
UN Number:	UN2923	UN2923
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7553-56-2 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 # 7553-56-2: 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# 7553-56-2 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:**

XN N

Risk Phrases:

R 20/21 Harmful by inhalation and in contact with skin.

R 50 Very toxic to aquatic organisms.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

S 25 Avoid contact with eyes.

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

WGK (Water Danger/Protection)

CAS# 7553-56-2: 1

Canada - DSL/NDSL

CAS# 7553-56-2 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# 7553-56-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Iodobenzene

ACC# 51742

Section 1 - Chemical Product and Company Identification

MSDS Name: Iodobenzene

Catalog Numbers: AC122330000, AC122330050, AC122330500, AC122331000, AC122332500, AC122335000 AC122335000

Synonyms: Phenyl iodide.

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
591-50-4	Iodobenzene	98	209-719-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear yellow liquid. Flash Point: 74 deg C.

Warning! Harmful if inhaled or swallowed. May cause eye, skin, and respiratory tract irritation. **Combustible liquid and vapor.**

Target Organs: Liver.

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.

Inhalation: Harmful if inhaled. May cause respiratory tract irritation.

Chronic: Chronic exposure 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. 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 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. Will burn if involved in a fire. Containers may explode in the heat of a fire. Combustible liquid and vapor.

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

Flash Point: 74 deg C (165.20 deg F)

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 2; 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). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Store protected from light.

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 only under a chemical fume hood.

Exposure Limits

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

OSHA Vacated PELs: Iodobenzene: 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 yellow

Odor: none reported

pH: Not available.

Vapor Pressure: 1.96 hPa @ 30 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 188 deg C @ 760 mmHg

Freezing/Melting Point: -29 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 1.820

Molecular Formula: C₆H₅I

Molecular Weight: 204.01

Section 10 - Stability and Reactivity

Chemical Stability: Light sensitive.

Conditions to Avoid: Incompatible materials, light, ignition sources, 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# 591-50-4: DA3390000

LD50/LC50:

CAS# 591-50-4:

Inhalation, rat: LC50 = 16320 mg/m³;

Oral, rat: LD50 = 1749 mg/kg;

Carcinogenicity:

CAS# 591-50-4: 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# 591-50-4 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 # 591-50-4: 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# 591-50-4 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 20/22 Harmful by inhalation and if swallowed.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

WGK (Water Danger/Protection)

CAS# 591-50-4: No information available.

Canada - DSL/NDSL

CAS# 591-50-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, 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

Iodoethane-d5, 99+ atom% d

ACC# 59412

Section 1 - Chemical Product and Company Identification

MSDS Name: Iodoethane-d5, 99+ atom% d

Catalog Numbers: AC278810000, AC278810010

Synonyms: Ethyl iodide

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
6485-58-1	Iodoethane-d5		unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear slight brown liquid. Flash Point: 53 deg C.

Warning! Harmful. **Flammable liquid and vapor.** Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction. May be absorbed through intact skin. May cause central nervous system depression. May cause lung damage. May cause liver and kidney damage. Light sensitive. Moisture sensitive.

Target Organs: Kidneys, central nervous system, liver, lungs, thyroid.

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. May be absorbed through the skin. May cause blistering of the skin.

Ingestion: May cause irritation of the digestive tract.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Dust is irritating to the respiratory tract. Causes respiratory tract irritation. May cause liver and kidney

damage. May cause narcotic effects in high concentration. May cause lung damage.

Chronic: Prolonged or repeated skin contact may cause irritation. Chronic inhalation may cause effects similar to those of acute inhalation.

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: 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. Vapors can travel to a source of ignition and flash back. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Will react with water to form toxic and corrosive fumes.

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

Flash Point: 53 deg C (127.40 deg F)

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. Remove all sources of ignition.

Section 7 - Handling and Storage

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. 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. 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
Iodoethane-d5	none listed	none listed	none listed

OSHA Vacated PELs: Iodoethane-d5: 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 slight brown

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 69 - 73 deg C @ 760.00mm Hg

Freezing/Melting Point:-108 deg C
Decomposition Temperature:Not available.
Solubility: Slightly soluble.
Specific Gravity/Density:1.9500g/cm3
Molecular Formula:C2D5I
Molecular Weight:161.01

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. May decompose on exposure to moist air or water. May discolor on exposure to light.

Conditions to Avoid: Incompatible materials, light, ignition sources, exposure to moist air or water.

Incompatibilities with Other Materials: Strong bases, strong oxidizing agents, magnesium, silver chlorite.

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

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 6485-58-1 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 6485-58-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: Mutation data reported..

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Water Danger/Protection: WGK 2

Environmental: Degradation studies: Oxidised by Nitrosomonas europaea at a rate of 19 nmol min mg/protein. Major product detected was acetic acid (Rasche, M.E. et al J. Bacteriol. 1990, 172(9), 5368-5373).

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:	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# 6485-58-1 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# 6485-58-1 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 10 Flammable.

R 20 Harmful by inhalation.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

WGK (Water Danger/Protection)

CAS# 6485-58-1: 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 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

Material Safety Data Sheet

Isopropyl Ether

ACC# 12140

Section 1 - Chemical Product and Company Identification

MSDS Name: Isopropyl Ether

Catalog Numbers: E141-4, E141-500, E141-500001, E141-500LC, NC9989229, XXE14120SL

Synonyms: Diisopropyl ether; Diisopropyl oxide; Ether, Isopropyl.

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
108-20-3	Isopropyl ether	>94.0	203-560-6
123-31-9	Hydroquinone	0.01	204-617-8

Hazard Symbols: F

Risk Phrases: 11 19 66 67

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: --18 deg F. Prolonged or repeated contact causes defatting of the skin with irritation, dryness, and cracking. May cause central nervous system depression. May cause respiratory and digestive tract irritation. May cause eye and skin irritation. **Danger! Extremely flammable liquid.** May form explosive peroxides.

Target Organs: Central nervous system.

Potential Health Effects

Eye: Causes mild eye irritation.

Skin: Causes skin irritation. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis.

Ingestion: May cause irritation of the digestive tract. 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 high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause respiratory tract irritation.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. 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: 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. 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: 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 may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid and vapor. Vapor may cause flash fire. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Forms peroxides of unknown stability. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use dry chemical, carbon dioxide, or alcohol-resistant foam. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: -18 deg F

Autoignition Temperature: 830 deg F (443.33 deg C)

Explosion Limits, Lower:1.4

Upper: 7.9

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

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: 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 saw dust.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Loosen closure cautiously before opening. 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 heat, sparks and flame. Avoid ingestion and inhalation. Store protected from light. If peroxide formation is suspected, do not open or move container. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat and flame. Keep away from sources of ignition. Purge container with nitrogen before resealing. Keep dry. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Storage under a nitrogen blanket has been recommended.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. 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
Isopropyl ether	250 ppm TWA; 310 ppm STEL	500 ppm TWA; 2100 mg/m ³ TWA 1400 ppm IDLH	500 ppm TWA; 2100 mg/m ³ TWA
Hydroquinone	2 mg/m ³ TWA	50 mg/m ³ IDLH	2 mg/m ³ TWA

OSHA Vacated PELs: Isopropyl ether: 500 ppm TWA; 2100 mg/m³ TWA 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. 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: ethereal odor

pH: Not available.

Vapor Pressure: 150 mm Hg @ 25 C

Vapor Density: 3.5

Evaporation Rate:8.4 (n-butyl acetate=1)

Viscosity: 0.38 mPa s 25 C

Boiling Point: 154 deg F

Freezing/Melting Point:-123 deg F

Decomposition Temperature:Not available.

Solubility: 0.65%

Specific Gravity/Density:0.72

Molecular Formula:C₆H₁₄O

Molecular Weight:102.0974

Section 10 - Stability and Reactivity

Chemical Stability: Peroxide formation may occur in containers that have been opened and remain in storage. Normally stable; however, on long term storage, materials containing similar functional groups form peroxides of unknown stability. May form explosive peroxides on prolonged storage.

Conditions to Avoid: High temperatures, incompatible materials, light, ignition sources, excess heat, strong oxidants.

Incompatibilities with Other Materials: Chlorosulfonic acid, nitric acid, strong oxidizers, acids, propionyl chloride.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 108-20-3: TZ5425000

CAS# 123-31-9: MX3500000

LD50/LC50:

CAS# 108-20-3:

Inhalation, mouse: LC50 = 131 gm/m³;

Inhalation, rabbit: LC50 = 121 gm/m³;

Inhalation, rat: LC50 = 162 gm/m³;

Oral, rat: LD50 = 8470 mg/kg;

Skin, rabbit: LD50 = 20 mL/kg; <BR.

CAS# 123-31-9:

Oral, mouse: LD50 = 245 mg/kg;

Oral, rabbit: LD50 = 200 mg/kg;

Oral, rat: LD50 = 302 mg/kg; <BR.

Carcinogenicity:

CAS# 108-20-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 123-31-9:

ACGIH: A3 - Animal Carcinogen

IARC: IARC Group 3 - not classifiable

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. LC50 = 91.7 mg/L/96 hr.(Fathead minnow); LC50 = 6600-7000 mg/L/96 hr.(Bluegill sunfish); EC50 = 500 mg/L/5 minutes (Photobacterium phosphoreum); Microtox test LC50 = 380 mg/L/24 hr. (Goldfish); Modified ASTM D1345.

Environmental: Isopropyl ether should volatilize in water. In air, it is expected to exist almost entirely in the vapor phase.

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	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	DIISOPROPYL ETHER				No information available.
Hazard Class:	3				
UN Number:	UN1159				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 108-20-3 is listed on the TSCA inventory.

CAS# 123-31-9 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 123-31-9: Effective Date: 10/4/84; Sunset Date: 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.

SARA

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 TPQ (lower threshold); 10,000 lb TPQ (upper threshold)

SARA Codes

CAS # 108-20-3: acute, flammable, reactive. CAS # 123-31-9: acute, chronic.

Section 313

This chemical is not at a high enough concentration to be reportable under Section 313. No chemicals are reportable under Section 313.

Clean Air Act:

CAS# 123-31-9 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# 108-20-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 123-31-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, 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 19 May form explosive peroxides.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapors may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 2 Keep out of reach of children.

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 108-20-3: 1

CAS# 123-31-9: 2

Canada - DSL/NDSL

CAS# 108-20-3 is listed on Canada's DSL List.

CAS# 123-31-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2B, F.

Canadian Ingredient Disclosure List

CAS# 108-20-3 is listed on the Canadian Ingredient Disclosure List.

CAS# 123-31-9 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 108-20-3: OEL-AUSTRALIA:TWA 250 ppm (1050 mg/m³);STEL 310 ppm (1320 mg/m³) OEL-BELGIUM:TWA 250 ppm (1040 mg/m³);STEL 310 ppm (1300 mg/m³) OEL-DENMARK:TWA 250 ppm (1050 mg/m³) OEL-FRANCE:TWA 250 ppm (1050 mg/m³) OEL-GERMANY:TWA 500 ppm (2100 mg/m³) OEL-THE NETHERLANDS: TWA 250 ppm (1050 mg/m³) JAN9 OEL-THE PHILIPPINES:TWA 500 ppm (2100 mg/m³) JAN9 OEL-POLAND:TWA 1000 mg/m³ OEL-RUSSIA:STEL 100 mg/m³ OEL-SWITZERLAND:TWA 250 ppm (1050 mg/m³) OEL-TURKEY:TWA 500 ppm (2100 mg/m³) OEL-UNITED KINGDOM:TWA 250 ppm (1050 mg/m³);STEL 310 ppm OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

CAS# 123-31-9: OEL-AUSTRALIA:TWA 2 mg/m³ OEL-BELGIUM:TWA 2 mg/m³ OEL-DENMARK:STEL 2 mg/m³ OEL-FINLAND:TWA 2 mg/m³;STEL 4 mg/m³;Skin OEL-FRANCE:TWA 2 mg/m³ OEL-GERMANY:TWA 2 mg/m³ OEL-THE NETHERLANDS:TWA 2 mg/m³ OEL-THE PHILIPPINES:TWA 2 mg/m³ OEL-POLAND:TWA 2 mg/m³ OEL-SWEDEN:TWA 0.5 mg/m³;STEL 1.5 mg/m³ OEL-SWITZERLAND:TWA 2 mg/m³;STEL 4 mg/m³ OEL-TURKEY:TWA 2 mg/m³ OEL-UNITED KINGDOM:TWA 2 mg/m³;STEL 4 mg/m³ OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Material Safety Data Sheet

Lead Nitrate, Reagent ACS (Crystals)

ACC# 00845

Section 1 - Chemical Product and Company Identification

MSDS Name: Lead Nitrate, Reagent ACS (Crystals)

Catalog Numbers: AC423850000, AC423850050, AC423855000

Synonyms: Lead (II) Nitrate; Lead Dinitrate; Nitric Acid Lead (II) 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
10099-74-8	Lead Nitrate	>99	233-245-9

Hazard Symbols: T

Risk Phrases: 20/22 33 61 62

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. **Danger!** Strong oxidizer. Contact with other material may cause a fire. May cause eye and skin irritation. May cause digestive tract irritation with nausea, vomiting, and diarrhea. May cause blood abnormalities. May cause kidney damage. May cause central nervous system effects. May cause cancer based on animal studies. May cause reproductive and fetal effects.

Target Organs: Blood, kidneys, central nervous system, respiratory system, gastrointestinal system, blood forming organs, nervous system, reproductive system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: Causes skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause effects similar to those for inhalation exposure.

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 adverse central nervous system effects including headache, convulsions, and possible death. May cause kidney damage. May cause anemia.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Prolonged or repeated exposure may cause adverse reproductive effects. May cause liver and kidney damage. 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. 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. 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.

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. Combustion generates toxic fumes. Oxidizer. Greatly increases the burning rate of combustible materials.

Extinguishing Media: Use water only!

Flash Point: 290 deg C (554.00 deg F)

Autoignition Temperature: Not available.

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. 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. Keep from contact with clothing and other combustible materials.

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.

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 Nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Lead 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. 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: 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: 470 deg C dec
Decomposition Temperature: 290 deg C
Solubility: 1g/2.5l absolute alcohol, 1g/75ml methan
Specific Gravity/Density: 4.5300g/cm³
Molecular Formula: PbN₂O₆
Molecular Weight: 331.20

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Decomposes when heated.

Conditions to Avoid: Incompatible materials, combustible materials, temperatures above 200°C.

Incompatibilities with Other Materials: Forms an explosive compound with: ammonium thiocyanate, potassium acetate, or lead hypophosphite. Other incompatibles include: aluminum, alkyl esters, carbon, hydroxylamine, phosphorus, phosphinates, sulfur, tin chloride.

Hazardous Decomposition Products: Nitrogen oxides, lead/lead oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10099-74-8: OG2100000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10099-74-8:

ACGIH: A3 - Animal Carcinogen (as Pb) (listed as Lead, inorganic compounds).

California: carcinogen; initial date 10/1/92 (listed as Lead).

OSHA: Possible select carcinogen (listed as Lead, inorganic compounds).

IARC: Group 2B 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: Effects on Newborn: Behavioral, oral-rat TDLo=43mg/kg; Growth Statistics, oral-rat TDLo=13g/kg. Embryo or Fetus: Death, intravenous(ivn)-hamster TDLo=50mg/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/kg.

Reproductive Effects: Fertility: Post-implantation mortality, ivn-rat TDLo=25mg/kg.
Maternal Effects: Parturition, ivn-rat TDLo=39964ug/kg.

Neurotoxicity: No information available.

Mutagenicity: DNA Inhibition: rat liver 100umol/L Gene Mutation in Mammalian Cells:
mouse lymphocyte 450mg/L

Other Studies: Please refer to RTECS OG1750000 for additional information.

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:	LEAD NITRATE				No information available.
Hazard Class:	5.1				
UN Number:	UN1469				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10099-74-8 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

CAS# 10099-74-8: 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 # 10099-74-8: acute, chronic, flammable, reactive.

Section 313

This material contains Lead Nitrate (listed as Lead), 99%, (CAS# 10099-74-8) 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:

CAS# 10099-74-8 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# 10099-74-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

WARNING: This product contains Lead Nitrate, listed as 'Lead', a chemical known to the state of California to cause birth defects or other reproductive harm. 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 13 Keep away from food, drink and animal feeding

stuffs.

S 20/21 When using do not eat, drink or smoke.

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# 10099-74-8: 2

Canada - DSL/NDSL

CAS# 10099-74-8 is listed on Canada's DSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

CAS# 10099-74-8 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 10099-74-8: OEL-ARAB Republic of Egypt:TWA 0.05 mg(Pb)/m³ OEL-AUSTRALIA:TWA 0.15 mg(Pb)/m³ OEL-AUSTRIA:TWA 0.1 mg(Pb)/m³ OEL-BELGIUM:TWA 0.15 mg(Pb)/m³ OEL-DENMARK:TWA 0.1 mg(Pb)/m³ OEL-FINLAND:TWA 0.1 mg(Pb)/m³ OEL-FRANCE:TWA 0.15 mg(Pb)/m³ OEL-GERMANY:TWA 0.1 mg(Pb)/m³ OEL-HUNGARY:STEL 0.04 mg(Pb)/m³;Carcinogen OEL-THE PHILIPPINES :TWA 0.15 mg(Pb)/m³ OEL-RUSSIA:STEL 0.005 ppm (0.01 mg(Pb)/m³) OEL-SWEDEN:TWA 0.05 mg(Pb)/m³ (resp. dust) OEL-SWEDEN:TWA 0.1 mg(Pb)/m³ (total dust) OEL-SWITZERLAND:TWA 0.1 mg(Pb)/m³ OEL-THAILAND:TWA 0.2 mg(Pb)/m³ OEL-TURKEY:TWA 0.2 mg(Pb)/m³ OEL-UNITED KINGDOM:TWA 0.15 mg(Pb)/m³ OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Material Safety Data Sheet

Ligroine, boiling point 100-140 degree C

ACC# 96206

Section 1 - Chemical Product and Company Identification

MSDS Name: Ligroine, boiling point 100-140 degree C

Catalog Numbers: AC233020000, AC233020025, AC233020100, AC233020250

Synonyms: Ligrion, refined solvent

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
8032-32-4	Ligroine	100	232-453-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid.

Danger! Extremely flammable liquid and vapor. Vapor may cause flash fire. Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. Prolonged or repeated contact causes defatting of the skin with irritation, dryness, and cracking. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause lung damage. May cause central nervous system depression.

Target Organs: Central nervous system.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Prolonged and/or repeated contact may cause irritation and/or dermatitis. Exposure may cause irritation characterized by redness, dryness, and inflammation.

Ingestion: Harmful if swallowed. Aspiration hazard. 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.

Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. High vapor concentrations may cause drowsiness.

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 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. 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.

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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Extremely flammable liquid and vapor. Vapor may cause flash fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use foam, dry chemical, or carbon dioxide. Water may be ineffective. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained.

Flash Point: Not available.

Autoignition Temperature: 220 deg C (428.00 deg F)

Explosion Limits, Lower: .60 vol %

Upper: 8.00 vol %

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: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. 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. Prevent build up of vapors to explosive concentration. 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. Flammables-area.

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
Ligroine	300 ppm TWA	350 mg/m ³ TWA	none listed

OSHA Vacated PELs: Ligroine: 300 ppm TWA; 1350 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: Liquid

Appearance: colorless

Odor: Mild gasoline like odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.
Evaporation Rate:>1
Viscosity: 25.00 deg C
Boiling Point: 107.0 - 138.0 deg C @ 760.00m
Freezing/Melting Point:-40 deg C
Decomposition Temperature:Not available.
Solubility: insoluble
Specific Gravity/Density:.7250g/cm3
Molecular Formula:Not available.
Molecular Weight:112.00

Section 10 - Stability and Reactivity

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

Conditions to Avoid: Ignition sources, excess heat.

Incompatibilities with Other Materials: Oxygen and strong oxidizing agents

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 8032-32-4: OI6180000

LD50/LC50:

CAS# 8032-32-4:

Inhalation, rat: LC50 = 3400 ppm/4H;

Carcinogenicity:

CAS# 8032-32-4:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
- **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

Ecotoxicity: No data available. Not available low potential to affect aquatic organisms, secondary waste treatment microorganisms and the germination of some plants. It has a moderate potential to affect the germination and growth of some plants.

Environmental: Not available

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:	PETROLEUM DISTILLATES, N.O.S.	PETROLEUM DISTILLATES NOS (LIGROINE)
Hazard Class:	3	3
UN Number:	UN1268	UN1268
Packing Group:	II	II
Additional Info:		FP -4 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 8032-32-4 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 # 8032-32-4: 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# 8032-32-4 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota.

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:

F

Risk Phrases:

R 11 Highly flammable.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 8032-32-4: 1

Canada - DSL/NDSL

CAS# 8032-32-4 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# 8032-32-4 is listed on the 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 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# 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 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 TPQ.

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 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# 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

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 TPQ.

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 NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

FISHER SCIENTIFIC CORP -- MERCURIC THIOCYANATE, M197 -- 6810-00N057065

=====
Product Identification
=====

Product ID:MERCURIC THIOCYANATE, M197
MSDS Date:05/01/1991
FSC:6810
NIIN:00N057065
MSDS Number: CDWLX
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC CORP
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num: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:THIOCYANIC ACID, MERCURY (II) SALT; (MERCURIC THIOCYANATE)
(SARA 313) (CERCLA)
CAS:592-85-8
RTECS #:XL1550000
Fraction by Wt: 100%
OSHA PEL:0.1 MG (HG)/M3; Z-2
ACGIH TLV:S,0.025 MG(HG)/M3
EPA Rpt Qty:10 LBS
DOT Rpt Qty:10 LBS

Ingred Name:SUPDAT:PURGING MAY OCCUR. PATIENT MAY DIE W/IN FEW MINS
FROM FLUID/ELECTROLYTE LOSSES & PERIPHERAL VASCULAR (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:COLLAPSE, BUT DEATH (FROM UREMIA) IS USUALLY DELAYED
5-12 DAYS. IF VICTIM SURVIVES THIS PHASE, PRIMARY GI (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:DISTURB USUALLY SUBSIDE. SECOND PHASE COMMONLY
DEVELOPS W/IN 1-3 DAYS AFTER EXPOS, & IS CHARACT BY INFLAMM(ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4:OF MOUTH, MEMBRANOUS COLITIS, & TUBULAR NEPHOROSIS.
SALIVARY GLANDS, KIDNEYS, & GI MUCOSA MAY SLOWLY (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:EXCRETE LG AMTS OF MERCURY. DEATH MAY OCCUR IN THIS
PHASE FROM RENAL FAILURE. MEAN LETHAL DOSE IN THIS (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:PHASE FROM RENAL FAILURE. CHRONIC:INHAL:INHAL OF
MERCURY VAP & DUSTS OVER LONG PERIOD MAY CAUSE (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7:MERCURIALISM. FINDINGS ARE EXTREMELY VARIABLE & MAY
INCL TREMORS, SALIVATION, INFLAMM OF MOUTH, LOSSENING (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8:OF TEETH, BLUE LINE ON GUMS, PAIN, & NUMBNESS IN
EXTREMETIES, NEPHRITIS, DIARR, ANXIETY, HDCH, WT LOSS, (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9:ANOREXIA, MENTAL DEPRESS, INSOMNIA, IRRITABILITY,
INSTABILITY, & HALLUCINATIONS. SKIN:MAY CAUSE IRRIT & (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10:SENSIT DERM. MAY RSLT IN PSYCHIC DISTURB, PERIPHERAL
NEUROPATHY, & KIDNEY DMG. INGEST:PRINCIPAL (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11:MANIFESTATION OF CHRONIC POIS ARE METALLIC TASTE,
EXCESS SALIVATION, GINGIVITIS, PYORRHEA W/LOOSENING (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 12:OF TEETH, DIGESTIVE DISORDERS, ABDOM DISTRESS, &
SKIN ERUPTIONS PROGRESSING TO DERM. SENSORY & MOTOR (ING 14)
RTECS #:9999999ZZ

Ingred Name:ING 13:NERVES MAY BE AFFECTED W/NUMBNESS & WEAK. LIVER &
KIDNEY DMG MAY OCCUR PROGRESSING TO ACUTE RENAL FAILURE(ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14:W/ANURIA. SUBTLE/DRAMATIC BEHAVIOR & PERSONALITY
CHANGES (ERITHISM) HAVE BEEN ASSOC W/CHRONIC MERCURIAL (ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15:POIS. MERCURY APPEARS ON NAVY LISTING OF OCCUP CHEM
RERPOD HAZS. SEEK CONSULTATION FROM APPROP HEALTH (ING 17)
RTECS #:9999999ZZ

Ingred Name:ING 16:PROFESSIONALS CONCERNING LATEST HAZARD LIST
INFORMATION & SAFE HANDLING & EXPOSURE INFORMATION .
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC:BY QUALIFIED MED PERS. MERCURY POIS:GIVE
DIMERCAPROL, 3 MG/KG (OR 0.3 ML/10 KG) EVERY 4 HRS FOR (ING 19)
RTECS #:9999999ZZ

Ingred Name:ING 18:FIRST 2 DYAS & THEN 2 MG/MG EVERY 12 HRS FOR TOTAL
OF 10 DAYS IF NEC. DIMERCAPROL IS AVAIL AS 10% SOLN (ING 20)
RTECS #:9999999ZZ

Ingred Name:ING 19:IN OIL FOR INTRAMUSCULAR ADMIN. HEMODIALYSIS WILL

SPEED REMOVAL OF MERCURY-DIMERCAPROL COMPLEX (ING 21)
RTECS #:9999999ZZ

Ingred Name:ING 20:PENICILLAMINE IS ALSO EFTIVE. GIVE UP TO 100
MG/KG/DAY (MAX 2 GR/DAY) DIVIDED INTO 4 DOSES FOR NO LONGER (ING
22)
RTECS #:9999999ZZ

Ingred Name:ING 21:THAN 2 WEEKS. IF LONGER ADMIN PERIOD IS WARRANTED,
DOSAGE SHOULD NOT EXCEED 40 MG/KG/DAY. GIVE DRUG (ING 23)
RTECS #:9999999ZZ

Ingred Name:ING 22:ORALLY HALF AN HOUR BEFORE MEALS. CHELATING AGENT
SHOULD BE CONTINUED UNTIL URINE-MERCURY LEVEL FALLS (ING 24)
RTECS #:9999999ZZ

Ingred Name:ING 23:BELOW 50 UG/24 HRS. ANTIDOTE SHOULD BE ADMINISTERED
BY QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

=====
===== Hazards Identification =====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 46 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:HIGH DUST CONCS MAY CAUSE SORE
THROAT, COUGH, DYSPNEA, LABORED BRTHG & DELAYED PULM EDEMA. INHAL
OF HIGH CONC OF MERCURY VAP CAN CAUSE ALMOST IMMED DYSPNEA, COUGH,
FEVER, NAUS, VOMIT DIARR, INFL AM OF MOUTH, SALIVATION, & METALLIC
TASTE. SYMPS MAY RESOLVE/MAY PROGRESS TO NECROTIZING
BRONCHIOLITIS, (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:HLTH HAZ:PNEUM, PULM EDEMA, & PNEUMOTHORAX.
ACIDOSIS & RENAL DMG W/RENAL FAILURE MAY OCCUR. SKIN:MAY CAUSE
REDNESS & IRRIT. SENSIT DERM. MAY OCCUR IN PREVIOUSLY EXPOS
WORKERS, SUBSTANCE MAY BE ABSORBE D THRU INTACT SKIN CAUSING
ANURIA. EYE:DIRECT CONT MAY CAUSE SERIOUS BURNS & PERM LOSS OF
VISION. CORNEAL (SUPDAT)
Medical Cond Aggravated by Exposure:PERSONS WITH PRE-EXISTING SKIN,
KIDNEY, NERV/CHRONIC RESPIRATORY DISORDERS MAY BE AT INCREASED RISK
FROM EXPOSURE.

=====
===== First Aid Measures =====

First Aid:INGEST:CALL MD IMMED . INHAL:REMOVE TO FRESH AIR. SUPPORT
BRTHG (GIVE OXYG/ARTF RESP) . EYES:IMMED FLUSH W/POTABLE WATER FOR
@ LST 15 MINS, SEEK ASSISTANCE FROM MD . SKIN:FLUSH W/COP IOUS AMTS
OF WATER. CALL MD. . ANTIDOTE:FOLLOWING ANTIDOTE HAS BEEN REC.
HOWEVER, DECISION AS TO WHETHER SEVERITY OF POIS REQS ADMIN OF ANY
ANTIDOTE & ACTUAL DOSE REQD SHOULD BE MADE (ING 18)

=====
===== Fire Fighting Measures =====

Flash Point:NON-FLAMMABLE
Extinguishing Media:DRY CHEM, CO*2, WATER SPRAY/REGULAR FOAM. LGR
FIRES:WATER SPRAY, FOG/REGULAR FOAM (1990 EMER RESPONSE
GUIDEBOOK, (SUPDAT)

Fire Fighting Procedures:NIOSH APPRVD SCBA & FULL PROT EQUIP . MOVE
CNTNR FROM FIRE AREA IF CAN BE DONE W/OUT RISK (1990 EMER RESPONSE
GUIDEBOOK, DOT P5800.5, GUIDE PG 53).

Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO
HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures:DO NOT TOUCH. STOP LEAK. TAKE UP ON ABSORB &
CONTAINERIZE FOR DISPOSAL. LRG SPILL:DIKE. KEEP PEOPLE AWAY. DENY
ENTRY. CONTACT NEHC FOR MORE SPECIFIC INFORMATION .

Neutralizing Agent:WATER SPILL:NEUTRALIZE WITH CAUSTIC SODA.

===== Handling and Storage =====

Handling and Storage Precautions:OBSERVE ALL FEDERAL, STATE & LOC REGS
WHEN STORING/DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONT
DISTRICT DIRECTOR OF ENVIR PROTECTION AGENCY.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN . FOR MORE SPECIFIC INFORMATION CONTACT NEHC .

Ventilation:PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED
EXPOSURE LIMITS.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPRVD CHEM WORKERS GOGGLES .

Other Protective Equipment:ANSI APPRVD EYE WASH & DELUGE SHOWER . AVOID
REPEATED OR PROLONGED CONT W/THIS SUBSTANCE.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

EXTING MEDIA:DOT P 5800.5). USE AGENTS SUITABLE FOR TYPE SURROUNDING
FIRE. USE WATER IN FLOODING AMTS AS FOG. AVOID BRTHG POIS
VAPS/DUSTS. EFTS OF OVEREXP:OPACIFICATION & NECROSIS MAY OCCUR.
INGEST:NE CROSIS BEGINS IMMED IN MOUTH, THROAT, ESOPHAGUS, & STOM.
W/IN FEW MINS, VIOLENT PAIN, PROFUSE VOMIT, & SEVERE (ING 2)

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:329F,165C

Evaporation Rate & Reference:NOT KNOWN

Solubility in Water:0.7%

Appearance and Odor:ODORLESS, WHITE POWDER.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

NONE SPECIFIED BY MANUFACTURER.

Stability Condition to Avoid:MAY BURN BUT DOES NOT IGNITE READILY. PVNT
DISPERSION OF DUST IN AIR. DO NOT ALLOW SPILLED MATL TO CONTAM
WATER SOURCES.

Hazardous Decomposition Products:THERMAL DECOMP PRODS INCL VERY TOX
VAPS OF MERCURY, NITROUS OXIDES, SULFUR OXIDES, & CYANIDE GAS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE I/A/W FED, ST, & LOC REGS .
MATLS WHICH CONTAIN SUBSTANCE @/ABOVE REGULATORY LEVEL MEET EPA
CHARACT OF TOX, & MUST BE DISPOSED OF I/A/W 40 CFR PART 262. EPA
HAZ WASTE NUMBER D00 9.

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particular situation.

FISHER SCIENTIFIC CO CHEMICAL DIV. -- MERCURIC CHLORIDE, M155 -- 6810-00-241-1190

=====
Product Identification
=====

Product ID:MERCURIC CHLORIDE, M155
MSDS Date:05/12/1992
FSC:6810
NIIN:00-241-1190
MSDS Number: BQKNS
=== 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:MERCURIC CHLORIDE (SARA III)
CAS:7487-94-7
RTECS #:OV9100000
Fraction by Wt: 100%
Other REC Limits:NONE SPECIFIED BY M.
OSHA PEL:0.1 MG HG/M3;SKIN;C
ACGIH TLV:0.1 MG HG/M3; 9192

=====
Hazards Identification
=====

LD50 LC50 Mixture:ORAL RAT LD50 1 MG/KG LDLO HUMAN 29 MG
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and
Chronic:ACUTE-INHALATION/SKIN/INGESTION:IRRITANT, SENSITIZER,
NEUROTOXIN AND NEPHROTOXIN AND HIGHLY TOXIC. EYE: CORROSIVE.
CHRONIC- LIVER AND KIDNEY DAMAGE, NEUROPATHY.
Effects of Overexposure:EYE:BURNS,CORNEAL INJURY. SKIN:IRRITATION,
SENSITIZATION, SYSTEMIC,ANURIA. INHAL:RESPIRATORY
IRRITATION,NAUSEA,VOMITING,DIARRHEA,METALIC TASTE, MERCURIALISM.
INGEST:G/I NECROSIS;VIOLENT PAIN,VOMITING, PURGING. CHRONIC:
METALLIC TASTE,PYORRHEA,DIGESTIVE DISORDERS,ERITHISM.
Medical Cond Aggravated by Exposure:LIVER, KIDNEY, SKIN, RESPIRATORY
DISEASES.

=====
===== First Aid Measures =====

First Aid:EYE:FLUSH IMMEDIATELY WITH WATER FOR 15 MIN.GET MEDICAL ATTENTION. SKIN:REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP & WATER. GET MEDICAL ATTENTION. INHAL:REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRAT ION IF NEEDED. GET PROMPT MEDICAL CARE.INGEST:IF CONSCIOUS,REMOVE BY GASTRIC LAVAGE OR EMISIS. MAINTAIN AIRWAY & GIVE OXYGEN IF NEEDED. GET IMMEDIATE MEDICAL CARE.

=====
===== Fire Fighting Measures =====

Flash Point:NONE
Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL, FOAM, WATER SPRAY.
Fire Fighting Procedures:WEAR SELF CONTAINED BREATHING APPARATUS. AVOID BREATHING DUSTS OR FUMES;POISONOUS.
Unusual Fire/Explosion Hazard:FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS, SUCH AS HYDROGEN CHLORIDE.

=====
===== Accidental Release Measures =====

Spill Release Procedures:WEAR GLOVES AND DUST MASK. ABSORB LIQUID WITH INERT MATERIAL. DRY SPILLS:COLLECT BY VACUUM. PLACE IN CLOSED CONTAINER FOR DISPOSAL. DO NOT CREAT DUST WHEN COLLECTING DRY SPILL.
Neutralizing Agent:NONE REPORTED.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY, WELL VENTILATED AREA.
Other Precautions:LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE NORMALLY NEEDED. USE NIOSH RESPIRATOR OR SUPPLIED AIR RESPIRATOR IF EXPOSED ABOVE TLV/PEL.
Ventilation:USE HOOD OR OTHER LOCAL EXHAUST TO MAINTAIN EXPOSURE BELOW TLV/PEL.
Protective Gloves:RUBBER OR OTHER IMPERVIOUS.
Eye Protection:SAFETY GLASSES OR SPLASH GOGGLES.
Other Protective Equipment:EYE WASH, SAFETY SHOWER, LAB COAT OR APRON, OTHER CLOTHING AS NEEDED TO PREVENT SKIN CONTACT.
Work Hygienic Practices:USE STRICT CHEMICAL HYGIENE PRACTICES. DO NOT WEAR CONTACT LENSES. AVOID ALL CONTACT POSSIBLE.
Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

HCC:T3
Boiling Pt:B.P. Text:576F/302C
Melt/Freeze Pt:M.P/F.P Text:529F,276C
Spec Gravity:5.0
pH:4.7
Solubility in Water:6.9%
Appearance and Odor:WHITE CRYSTALS OR POWDER, ODORLESS.

Percent Volatiles by Volume:0

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
POTASSIUM AND SODIUM (STRONG EXPLOSION ON IMPACT).
Stability Condition to Avoid:HIGH TEMPERATURES.
Hazardous Decomposition Products:CORROSIVE HYDROGEN CHLORIDE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND
FEDERAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

FISHER SCIENTIFIC, CHEMICAL DIV. -- METHYL ISOBUTYL KETONE -- 6810-00-052-1371

=====
Product Identification
=====

Product ID:METHYL ISOBUTYL KETONE
MSDS Date:07/26/1989
FSC:6810
NIIN:00-052-1371
MSDS Number: BMWFS
=== 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
Emergency Phone Num:201-796-7100 OR 201-796-7523
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:METHYL ISOBUTYL KETONE (SARA III)
CAS:108-10-1
RTECS #:SA9275000
Fraction by Wt: 100%
Other REC Limits:NONE SPECIFIED
OSHA PEL:100 PPM/75 STEL
ACGIH TLV:50 PPM/75 STEL; 9293
EPA Rpt Qty:5000 LBS
DOT Rpt Qty:5000 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD 50 ORAL RAT IS 2080 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:HEALTH HAZARDS: ACUTE: EYE AND
RESPIRATORY TRACT IRRITATION. . CENTRAL NERVOUS SYSTEM EFFECTS.
ASPIRATION MAY CAUSE BRONCHIOPNEUMONIA OR PULMONARY EDEMA. NARCOTIC
EFFECTS AND GASTROENTERITIS IF INGEST IED. CHRONIC: CONJUNCTIVITIS,
SKIN IRRITATION, DERMATITIS.
Explanation of Carcinogenicity:NONE OF THE INGREDIENTS IN THIS PRODUCT
IS LISTED BY NTP, IARC OR OSHA AS A CARCINOGEN.
Effects of Overexposure:EYES: IRRITATION, INJURY. SKIN: IRRITATION,
DERMATITIS. INHALATION: RESPIRATORY TRACT IRRITATION, HEADACHES,

DIZZINESS, ANESTHETIC EFFECTS. INGESTION: COUGHING, HEADACHE,
DIZZINESS, DULLNESS, VOMITIN G.

Medical Cond Aggravated by Exposure:INDIVIDUALS WITH PREEEXISTING EYES,
SKIN, RESPIRATORY, OR CENTRAL NERVOUS SYSTEM DISORDERS MAY BE MORE
ADVERSELY AFFECTED BY EXPOSURE TO THIS PRODUCT.

=====
===== First Aid Measures =====

First Aid:EYES:FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.IF
IRRITATION PERSISTS,SEE DOCTOR. SKIN:WASH WITH SOAP AND WATER WHILE
REMOVING CONTAMINATED CLOTHING AND SHOES. INHALATION:REMOVE VICTIM
TO FRE SH AIR.GIVE OXYGEN/CPR IF NEEDED.SEE DOCTOR. INGESTION:DO
NOT INDUCE VOMITING.SEE DOCTOR IMMEDIATELY.

=====
===== Fire Fighting Measures =====

Flash Point Method:CC
Flash Point:64.0F,17.8C
Autoignition Temp:Autoignition Temp Text:840F
Lower Limits:1.2
Upper Limits:8.0
Extinguishing Media:USE WATER FOG, CARBON DIOXIDE, FOAM, HALON, OR DRY
CHEMICAL.
Fire Fighting Procedures:WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A
FULL FACED SELF CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED
CONTAINERS WITH WATER SPRAY.
Unusual Fire/Explosion Hazard:COMBUSTION OR HEAT OF FIRE MAY PRODUCE
HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS. VAPORS HEAVIER THAN
AIR, CAN TRAVEL A LONG DISTANCE AND FLASHBACK.

=====
===== Accidental Release Measures =====

Spill Release Procedures:REMOVE PERSONNEL.ELIMINATE IGNITION
SOURCES.VENTILATE AREA.WEAR PROTECTIVE CLOTHING AND
EQUIPMENT.ABSORB IN INERT MATERIAL AND PLACE IN APPROPRIATE DISPOSAL
CONTAINER AND COVER.

=====
===== Handling and Storage =====

Handling and Storage Precautions:STORE IN COOL, DRY, WELL VENTILATED
AREA. PROTECT FROM PHYSICAL DAMAGE, HEAT, IGNITION SOURCES AND
INCOMPATIBLE MATERIALS. KEEP CONTAINERS CLOSED.
Other Precautions:AVOID EYE AND SKIN CONTACT. DO NOT BREATHE VAPORS.

=====
===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE NORMALLY REQUIRED. NIOSH/MSHA-APPROVED
RESPIRATOR OR SCBA AS APPROPRIATE FOR EXPOSURE OF CONCERN.
Ventilation:LOCAL EXHAUST VENTILATION TO KEEP EXPOSURE LEVELS BELOW
PEL.
Protective Gloves:RUBBER GLOVES.
Eye Protection:CHEMICAL SAFETY GOGGLES.
Other Protective Equipment:PROTECTIVE CLOTHING AS REQUIRED TO MINIMIZE
EXPOSURE FROM PROLONGED OR REPEATED CONTACT. EYE BATH AND SAFETY
SHOWER.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING AND BEFORE
EATING. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

Supplemental Safety and Health
NONE.

===== Physical/Chemical Properties =====

HCC:F2
Boiling Pt:B.P. Text:244F,118C
Melt/Freeze Pt:M.P/F.P Text:-120F,-84C
Vapor Pres:15.7
Vapor Density:3.5
Spec Gravity:0.800
Evaporation Rate & Reference:1.6 (BUTYL ACETATE = 1)
Solubility in Water:1.9%
Appearance and Odor:COLORLESS LIQUID WITH A FAINT PLEASANT KETONIC AND
CAMPHOR ODOR.
Percent Volatiles by Volume:100

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, REDUCING AGENTS.
Stability Condition to Avoid:HIGH HEAT, OPEN FLAMES AND OTHER SOURCES
OF IGNITION
Hazardous Decomposition Products:CARBON MONOXIDE, CARBON DIOXIDE,
INCOMPLETELY BURNED CARBON PRODUCTS.

===== Disposal Considerations =====

Waste Disposal Methods:CONTACT YOUR LOCAL ENVIRONMENTAL OFFICER.
DISPOSE OF IN ACCORDANCE WITH ALL 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

Methyl acetate, 99%

ACC# 00961

Section 1 - Chemical Product and Company Identification

MSDS Name: Methyl acetate, 99%

Catalog Numbers: AC181380000, AC181380010, AC181380025

Synonyms: Acetic acid, methyl ester; Methyl ethanoate.

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
79-20-9	Methyl acetate	99	201-185-2

Hazard Symbols: XI F

Risk Phrases: 11 36 66 67

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear liquid. Flash Point: -10 deg C. **Danger!** Causes eye irritation. Causes respiratory tract irritation. May cause skin irritation. May cause central nervous system depression. Extremely flammable liquid and vapor. Vapor may cause flash fire.

Target Organs: Central nervous system, eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause moderate skin irritation. Repeated or prolonged exposure may cause drying and cracking of the skin.

Ingestion: May cause irritation of the digestive tract. Exposure may cause optic nerve degeneration and possible blindness.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause narcotic effects in high concentration. Exposure may

produce optic nerve damage and possible blindness. Overexposure may lead to convulsions, shortness of breath, and stupor.

Chronic: Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged skin exposure may produce dryness, cracking and 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: 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. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Extremely flammable liquid and vapor. Vapor may cause flash fire. 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 to cool fire-exposed containers. Use foam, dry chemical, or carbon dioxide. Water may be ineffective.

Flash Point: -10 deg C (14.00 deg F)

Autoignition Temperature: 454 deg C (849.20 deg F)

Explosion Limits, Lower: 3.1 vol %

Upper: 16.0 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 3; 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.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid breathing vapor or mist.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-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
Methyl acetate	200 ppm TWA; 250 ppm STEL	200 ppm TWA; 610 mg/m ³ TWA 3100 ppm IDLH	200 ppm TWA; 610 mg/m ³ TWA

OSHA Vacated PELs: Methyl acetate: 200 ppm TWA; 610 mg/m³ TWA

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: clear

Odor: Pleasant odor

pH: Not available.

Vapor Pressure: 100 mm Hg @9.4C

Vapor Density: 2.8 (air=1)

Evaporation Rate:11.8 (butyl acetate=1)

Viscosity: 0.38 mPas 20 deg C

Boiling Point: 57.4 deg C @ 760 mm Hg

Freezing/Melting Point:-98 deg C

Decomposition Temperature:Not available.

Solubility: Soluble.

Specific Gravity/Density:.9300 g/cm3

Molecular Formula:C3H6O2

Molecular Weight:74.08

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, strong bases, nitrates.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 79-20-9: AI9100000

LD50/LC50:

CAS# 79-20-9:

Dermal, guinea pig: LD50 = >20 mL/kg;

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Oral, rabbit: LD50 = 3705 mg/kg;

Oral, rat: LD50 = >5 gm/kg;

Skin, rabbit: LD50 = >5 gm/kg;<BR.

Carcinogenicity:

CAS# 79-20-9: 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: Mutation data has been reported.

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:	METHYL ACETATE				No information available.
Hazard Class:	3				
UN Number:	UN1231				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 79-20-9 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

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 # 79-20-9: 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 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# 79-20-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, 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:

XI F

Risk Phrases:

R 11 Highly flammable.

R 36 Irritating to eyes.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapors may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

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

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

WGK (Water Danger/Protection)

CAS# 79-20-9: 1

Canada - DSL/NDSL

CAS# 79-20-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2B.

Canadian Ingredient Disclosure List

CAS# 79-20-9 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 79-20-9: OEL-AUSTRALIA:TWA 200 ppm (610 mg/m³);STEL 250 ppm (760 mg/m³) OEL-BELGIUM:TWA 200 ppm (610 mg/m³);STEL 250 ppm (760 mg/m³) OEL-CZECHOSLOVAKIA:TWA 200 mg/m³;STEL 600 mg/m³ OEL-DENMARK:TWA 200 ppm (610 mg/m³) OEL-FINLAND:TWA 200 ppm (610 mg/m³);STEL 250 ppm (765 mg/m³) OEL-FRANCE:TWA 200 ppm (610 mg/m³);STEL 250 ppm (760 mg/m³) OEL-GERMANY:TWA 200 ppm (610 mg/m³) OEL-HUNGARY:TWA 200 mg/m³;STEL 500 mg/m³;Skin OEL-JAPAN:TWA 200 ppm (610 mg/m³) OEL-THE NETHERLANDS: TWA 200 ppm (610 mg/m³) OEL-THE PHILIPPINES:TWA 200 ppm (610 mg/m³) OEL-POLAND:TWA 100 mg/m³ OEL-RUSSIA:TWA 200 ppm;STEL 100 mg/m³ OEL-SWITZERLAND:TWA 200 ppm (610 mg/m³);STEL 400 ppm OEL-TURKEY:TWA 200 ppm (610 mg/m³) OEL-UNITED KINGDOM:TWA 200 ppm (610 mg/m³);STEL 250 ppm OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Material Safety Data Sheet

Methyl Green (Cert)

ACC# 67402

Section 1 - Chemical Product and Company Identification

MSDS Name: Methyl Green (Cert)

Catalog Numbers: AC414380000, AC414380250

Synonyms: Iodin Green (Griesbach).

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
14855-76-6	Methyl Green (Cert)	ca. 100%	238-920-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark red 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: 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.

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methyl Green (Cert)	none listed	none listed	none listed

OSHA Vacated PELs: Methyl Green (Cert): 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: dark red to 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: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula:C27H35BrClN3

Molecular Weight:516.95

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: Hydrogen chloride, nitrogen oxides, carbon monoxide, carbon dioxide, hydrogen bromide, nitrogen gas.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 14855-76-6 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 14855-76-6: 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# 14855-76-6 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# 14855-76-6 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# 14855-76-6: No information available.

Canada - DSL/NDSL

CAS# 14855-76-6 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

FENDALL COMPANY -- METHYLPARABEN,NF -- 6850-00N011320

=====
Product Identification
=====

Product ID:METHYLPARABEN,NF
MSDS Date:05/01/1986
FSC:6850
NIIN:00N011320
MSDS Number: BJKBZ
=== Responsible Party ===
Company Name:FENDALL COMPANY
Address:5 E COLLEGE DRIVE
City:ARLINGTON HTS
State:IL
ZIP:60004
Info Phone Num:312-577-7400
Emergency Phone Num:312-577-7400
CAGE:95617
=== Contractor Identification ===
Company Name:FENDALL COMPANY
Address:5 E COLLEGE DRIVE
Box:City:ARLINGTON HTS
State:IL
ZIP:60004
Phone:312-577-7400
CAGE:95617

=====
Composition/Information on Ingredients
=====

Ingred Name:METHYL-P-HYDROXYBENZOATE
CAS:99-76-3
RTECS #:DH2450000
Other REC Limits:N/K
OSHA PEL:N/K
ACGIH TLV:N/K

=====
Hazards Identification
=====

LD50 LC50 Mixture:N/K
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:SEE SIGNS AND SYMPTOMS OF
OVEREXPOSURE.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:EYES:N/K .SKIN:PROLONGED/REPEATED CONTACT MAY
CAUSE SKIN IRRITATION IN SOME CASES.INGESTION:TOXICITY IS
LOW.INHALATION:INHALATION OF CONCENTRATED DUST MAY CAUSE MILD
IRRITATION.
Medical Cond Aggravated by Exposure:N/K

=====
First Aid Measures
=====

First Aid:EYES:FLUSH WITH WATER FOR AT LEAST 15 MIN.SKIN:WASH OFF WITH
SOAP AND WATER.INGESTION:CALL MD IMMEDIATELY .INHALATION:MOVE TO
FRESH AIR.

=====
Fire Fighting Measures
=====

Extinguishing Media:WATER SPRAY,FOAM,CARBON DIOXIDE OR DRY CHEMICAL.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:CONCENTRATED DUST MAY PRESENT DUST
EXPLOSION HAZARD.ELIM IGNIT SOURCES.BURNING MAY PRODUCE IRRITATING
FUMES,REQUIRING PROT EQUIP (PHENOLIC VAPORS & CO).

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP AND REMOVE TO DISPOSAL CONTAINER.
Neutralizing Agent:N/K

===== Handling and Storage =====

Handling and Storage Precautions:MINIMIZE DUST BY CLEANING UP POWDER
ACCUMULATIONS FROM FLOOR,WALLS AND EQUIPMENT.STORE IN COOL,DRY
PLACE.

Other Precautions:N/K

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN .

Ventilation:LOCAL AND GENERAL VENTILATION NECESSARY TO KEEP AIR
CONCENTRATION BELOW LEVEL OF CONCERN .

Protective Gloves:TO MINIMIZE SKIN CONTACT.

Eye Protection:CHEMICAL WORKERS GOGGLES .

Other Protective Equipment:NONE IN ORDINARY USE.

Work Hygienic Practices:ORDINARY MEASURES OF PERSONAL HYGIENE ARE
ADEQUATE.

Supplemental Safety and Health

% VOLATILES BY VOLUME:NEGLIGIBLE/SLIGHT.ROUTES OF
ENTRY:INHALATION/INGESTION/SKIN .

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:518F,270C

Melt/Freeze Pt:M.P/F.P Text:N/K

Decomp Temp:Decomp Text:N/K

Spec Gravity:1.36 (WATER=1)

Evaporation Rate & Reference:NOT VOLATILE

Solubility in Water:NEGLIGIBLE (0.25%)

Appearance and Odor:WHITE POWDER,ODORLESS OR NEARLY SO.

Percent Volatiles by Volume:SUP DA

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

AVOID CONTACT WITH STRONG OXIDIZING AGENTS.

Stability Condition to Avoid:AVOID CREATING DUST.CONCENTRATED DUST MAY
PRESENT EXPLOSION HAZARD.

Hazardous Decomposition Products:BURNING MAY PRODUCE PHENOLIC VAPORS
AND CARBON MONOXIDE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE IAW LOCAL,STATE & FEDERAL REGULATIONS
REGARDING HEALTH & WATER OR AIR POLLUTION.BURN IN AN APPROVED
INCINERATOR OR USE SANITARY LANDFILL.DO NOT INCINERATE IN CLOSED
CONTAINERS.

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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

N,N-Dimethylformamide

ACC# 07860

Section 1 - Chemical Product and Company Identification

MSDS Name: N,N-Dimethylformamide

Catalog Numbers: AC116220000, AC116220025, AC116220050, AC116220250, AC167790000, AC167790010, AC167790025, AC167795000, AC210580000, AC210580010, AC210580025, AC210580250, AC210585000, AC279600000, AC279600010, AC279600025, AC326870000, AC326870010, AC326870025, AC326871000, AC326872500, AC327170000, AC327175000, AC348430000, AC348430010, AC348430025, AC348431000, AC348435000, AC354830000, AC354830010, AC354830025, AC354830100, AC408310000, AC408320000, AC423640000, AC423640250, AC423645000, AC61032019, AC61032019, AC61032050, AC61032050, AC61032115, AC61032115, AC61032200, AC61032200, AC610530190, AC610530500, AC610531150, AC610532000, AC610730190, AC610730500, AC610731150, AC610732000, 11622-0010, 27960-0040, 40831-1000, 40832-5000, 42364-0010, 61032-0010, 61032-1000, 61094-1000, BP1160-4, BP1160-500, BP1160N219, BP1160POP-200, BP1160POP-50, BP1160POP20, BP1160RS-200, BP1160RS115, BP1160RS19, BP1160RS28, BP1160RS50, BP1160SS-50, D119-1, D119-20, D119-200, D119-4, D119-500, D11920LC, D119FB-200, D119FB115, D119FB19, D119FB50, D119J4, D119POP19, D119RB115, D119RB19, D119RB200, D119RB50, D119RS-200, D119RS115, D119RS28, D119RS50, D119S-4, D119SS115, D119SS200, D119SS28, D119SS50, D131-1, D131-4, D131POP-50, D131RS-19, D131RS-200, D132-1, D132RS-19, D132RS-50, NC9542368, NC9734650, PS03494, S79999SPEC

Synonyms: N,N-Dimethylmethanamide; DMF; Dimethylformamide.

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
68-12-2	N,N-Dimethylformamide	99+	200-679-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: APHA: 20 max liquid. Flash Point: 58 deg C.

Warning! Flammable liquid and vapor. May cause harm to the unborn child. Harmful if absorbed through skin or if inhaled. Lachrymator (substance which increases the flow of tears). Causes eye and skin irritation. May cause respiratory tract irritation. May cause liver and kidney damage. May cause central nervous system effects.

Target Organs: Blood, kidneys, central nervous system, liver, spleen, respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Lachrymator (substance which increases the flow of tears).

Skin: Causes skin irritation. Harmful if absorbed through the skin. Substance is rapidly absorbed through the skin.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May be harmful if swallowed.

Inhalation: Harmful if inhaled. May cause respiratory tract irritation. May cause central nervous system effects.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause damage to the spleen. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects. Possible risk of harm to the unborn child.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Immediately flush eyes with plenty of water for at least 15 minutes.

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. Vapors

may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Containers may explode in the heat of a fire. Flammable liquid and vapor.

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

Flash Point: 58 deg C (136.40 deg F)

Autoignition Temperature: 445 deg C (833.00 deg F)

Explosion Limits, Lower:2.2 vol %

Upper: 16 vol %

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: 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). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Take precautionary measures against static discharges. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Flammables-area.

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 only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
N,N-Dimethylformamide	10 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	10 ppm TWA; 30 mg/m ³ TWA 500 ppm IDLH	10 ppm TWA; 30 mg/m ³ TWA

OSHA Vacated PELs: N,N-Dimethylformamide: 10 ppm TWA; 30 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: 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 - APHA: 20 max

Odor: amine-like

pH: 6 - 8 @ 20% aq.sol.

Vapor Pressure: 4.9 mbar @ 20 C

Vapor Density: 2.5 (air=1)

Evaporation Rate:0.17 (butylacetate=1)

Viscosity: 0.8 mPas @ 20 C

Boiling Point: 153 deg C

Freezing/Melting Point:-61 deg C

Decomposition Temperature:Not available.

Solubility: Soluble.

Specific Gravity/Density:0.94

Molecular Formula:C₃H₇NO

Molecular Weight:73.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat.

Incompatibilities with Other Materials: Reducing agents, acids, alkali metals, halogenated agents, nitrates, metal oxides, chloroformates.

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

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:**CAS#** 68-12-2: LQ2100000**LD50/LC50:**

CAS# 68-12-2:

Inhalation, mouse: LC50 = 9400 mg/m³/2H;

Inhalation, rat: LC50 = 3421 ppm/1H;

Inhalation, rat: LC50 = 3421 ppm/3H;

Inhalation, rat: LC50 = 1948 ppm/4H;

Oral, mouse: LD50 = 2900 mg/kg;

Oral, rabbit: LD50 = 5 gm/kg;

Oral, rat: LD50 = 2800 mg/kg;

Skin, rabbit: LD50 = 4720 mg/kg;

Skin, rat: LD50 = >3.2 gm/kg;

Carcinogenicity:

CAS# 68-12-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found IARC Group 3: Limited or insufficient evidence for carcinogenicity in both animals and humans.**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

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:	N,N-DIMETHYLFORMAMIDE	N,N-DIMETHYLFORMAMIDE
Hazard Class:	3	3
UN Number:	UN2265	UN2265
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 68-12-2 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 68-12-2: Effective 4/13/89, Sunset 12/19/95

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# 68-12-2: 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 # 68-12-2: immediate, fire.

Section 313

This material contains N,N-Dimethylformamide (CAS# 68-12-2, 99+%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

CAS# 68-12-2 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# 68-12-2 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:

T

Risk Phrases:

R 20/21 Harmful by inhalation and in contact with skin.

R 36 Irritating to eyes.

R 61 May cause 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.

WGK (Water Danger/Protection)

CAS# 68-12-2: 1

Canada - DSL/NDSL

CAS# 68-12-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B3, 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# 68-12-2 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

Material Safety Data Sheet

Naphthalene, 98%

ACC# 96302

Section 1 - Chemical Product and Company Identification

MSDS Name: Naphthalene, 98%

Catalog Numbers: AC164210000, AC164210010, AC164210025

Synonyms: Coal tar camphor; Tar camphor; Naphthalin; White tar; Naphthene; Moth flakes; Moth balls.

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
91-20-3	Naphthalene	98	202-049-5

Hazard Symbols: XN N

Risk Phrases: 22 50/53

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. Flash Point: 78 deg C. **Warning!** May cause blood abnormalities. Hygroscopic (absorbs moisture from the air). Causes eye and skin irritation. Flammable solid. May be harmful if absorbed through the skin. Harmful if inhaled or swallowed. Causes respiratory tract irritation.

Target Organs: Blood, respiratory system, eyes, skin.

Potential Health Effects

Eye: Naphthalene is an eye irritant. The vapor causes eye irritation at 15 ppm. Eye contact with the solid material may result in conjunctivitis, superficial injury to the cornea, diminished visual acuity, and other effects. It may cause cataracts.

Skin: Causes mild skin irritation. May be absorbed through the skin in harmful amounts. Incidence of skin hypersensitivity is not widespread in the general population &, based on the long history of use of naphthalene as a consumer product, this effect is mostly confined

to industrial exposure where coal tar contamination may be present.

Ingestion: Harmful if swallowed. May cause liver and kidney damage. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. Ingestion of large quantities may cause severe hemolytic anemia and hemoglobinuria.

Inhalation: Harmful if inhaled. Causes respiratory tract irritation. Readily absorbed when inhaled. Material volatilizes at room temperature. Hemolytic anemia (destruction of red blood cells) is the primary health concern for humans exposed to naphthalene for either short or long periods of time. Other effects may include nausea, profuse perspiration, vomiting, kidney damage and liver damage. Optic neuritis (inflammation of the optic nerve) has been observed. Cataracts have also occurred.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Animal studies have reported that fetal effects/abnormalities may occur when maternal toxicity is seen. Effects may be delayed. Chronic exposure may cause lung damage. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause corneal injury, optic neuritis, blurred vision, and possible cataract formation. 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.

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: Individuals with a glucose-6-phosphate dehydrogenase deficiency are hypersensitive to the effects of naphthalene.

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. Use water spray to keep fire-exposed containers cool. Flammable solid. Dusts may be an explosion hazard if mixed with air at critical proportions and in the presence of an ignition source. Volatile solid that gives off flammable vapors when heated.

Extinguishing Media: Water or foam may cause frothing. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 78 deg C (172.40 deg F)

Autoignition Temperature: 526 deg C (978.80 deg F)
Explosion Limits, Lower:0.90 vol %
Upper: 5.90 vol %
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: Avoid runoff into storm sewers and ditches which lead to waterways. 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. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. 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. Use only with adequate ventilation.
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. Storage under a nitrogen blanket has been recommended. Store protected from moisture. Separate from oxidizing materials.

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 general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Naphthalene	10 ppm TWA; 15 ppm STEL; skin - potential for cutaneous absorption	10 ppm TWA; 50 mg/m ³ TWA 250 ppm IDLH	10 ppm TWA; 50 mg/m ³ TWA

OSHA Vacated PELs: Naphthalene: 10 ppm TWA; 50 mg/m³ TWA

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: 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: Solid

Appearance: white

Odor: Distinctive mothball-like.

pH: Not available.

Vapor Pressure: 0.05 mm Hg @ 20 deg C

Vapor Density: 4.4 (air=1)

Evaporation Rate: <1.0 (butyl acetate=1)

Viscosity: Not available.

Boiling Point: 218 deg C

Freezing/Melting Point: 79 - 82 deg C

Decomposition Temperature: 540 deg C

Solubility: Insoluble.

Specific Gravity/Density: 0.9900g/cm³

Molecular Formula: C₁₀H₈

Molecular Weight: 128.17

Section 10 - Stability and Reactivity

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

Conditions to Avoid: Ignition sources, dust generation, moisture, excess heat, exposure to moist air or water, steam.

Incompatibilities with Other Materials: Strong 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# 91-20-3: QJ0525000

LD50/LC50:

CAS# 91-20-3:

Draize test, rabbit, eye: 100 mg Mild;
Inhalation, rat: LC50 = >340 mg/m³/1H;
Oral, mouse: LD50 = 316 mg/kg;
Oral, rat: LD50 = 490 mg/kg;
Skin, rabbit: LD50 = >20 gm/kg;
Skin, rat: LD50 = >2500 mg/kg;<BR.

Carcinogenicity:

CAS# 91-20-3:

ACGIH: A4 - Not Classifiable as a Human Carcinogen**California:** carcinogen; initial date 4/19/02**IARC:** Group 2B carcinogen**Epidemiology:** Incidents in which blankets or clothing containing naphthalene caused acute hemolysis in infants, in some cases fatal, have been described. The percutaneous absorption and systemic intoxication with naphthalene can be facilitated by oily vehicles.**Teratogenicity:** Naphthalene and its metabolites have been reported to cross the human placenta in amounts sufficient to cause fetal toxicity. Oral, rat: TDLo = 4500 mg/kg (female 6-15 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) and Specific Developmental Abnormalities - other developmental abnormalities.; Intraperitoneal, rat: TDLo = 5925 mg/kg (female 1-15 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system and cardiovascular (circulatory) system.**Reproductive Effects:** No information available.**Neurotoxicity:** No information available.**Mutagenicity:** Micronucleus Test: Human, Lymphocyte = 30 mg/L.; Cytogenetic Analysis: Hamster, Ovary = 30 mg/L.; Sister Chromatid Exchange: Hamster, Ovary = 15 mg/L.**Other Studies:** Standard Draize Test: Administration onto the skin (rabbit) = 495 mg (Mild).; Standard Draize Test: Administration into the eye (rabbit) = 100 mg (Mild).

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 1.60 mg/L; 96 Hr; Flow-through at 15 C Fathead Minnow: LC50 = 6.14 mg/L; 96 Hr; Flow-through at 24.5 C flea Daphnia: EC50 = 2.16-8.60 mg/L; 48 Hr; Unspecified: Phytobacterium phosphoreum: EC50 = 0.93 mg/L; 30 min; Microtox test Pink salmon: LC50 = 1.24 mg/L; 96 Hr; (fry) Static bioassay at 12°C Releases into water are lost due to volatilization, photolysis, adsorption, and biodegradation. The principal loss processes will depend on local conditions but half-lives can be expected to range from a couple of days to a few months. When adsorbed to sediment, biodegradation occurs much more rapidly than in the overlying water column. When spilled on land, naphthalene is adsorbed moderately to soil and undergoes biodegradation. However, in some cases it will appear in the groundwater where biodegradation still may occur if conditions are aerobic.**Environmental:** Bioconcentration occurs to a moderate extent but since depuration and metabolism readily proceed in aquatic organisms, this is a short term problem. transport and disposal of fuel oil, coal tar, etc. In the atmosphere, naphthalene rapidly photodegrades (half-life 3-8 hr). Naphthalene shows low biological oxygen demand and is expected to cause little O₂ depletion in aquatic systems.

Physical: Log P (oct) = 3.01 - 3.59

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: CAS# 91-20-3: waste number U165.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	NAPHTHALENE, CRUDE				No information available.
Hazard Class:	4.1				
UN Number:	UN1334				
Packing Group:	III				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 91-20-3 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 91-20-3: Effective Date: 6/1/87; Sunset Date: 6/1/97

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# 91-20-3: 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 # 91-20-3: acute, chronic, flammable.

Section 313

This material contains Naphthalene (CAS# 91-20-3, 98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 91-20-3 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# 91-20-3 is listed as a Hazardous Substance under the CWA. CAS# 91-20-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 91-20-3 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# 91-20-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

The following statement(s) is(are) made in order to comply with the California

Safe Drinking Water Act: WARNING: This product contains Naphthalene, 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 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 60 This material and/or 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# 91-20-3: 2

Canada - DSL/NDSL

CAS# 91-20-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D1B, D2B.

Canadian Ingredient Disclosure List

CAS# 91-20-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 91-20-3: OEL-ARAB Republic of Egypt:TWA 10 ppm (50 mg/m3) OEL-

AUSTRALIA:TWA 10 ppm (50 mg/m³);STEL 15 ppm (75 mg/m³) OEL-BELGIUM:TW
A 10 ppm (52 mg/m³);STEL 15 ppm (79 mg/m³) OEL-DENMARK:TWA 10 ppm (50
mg/m³) OEL-FINLAND:TWA 10 ppm (50 mg/m³);STEL 20 ppm (10 mg/m³) OEL
-FRANCE:TWA 10 ppm (50 mg/m³) OEL-GERMANY:TWA 10 ppm (50 mg/m³) OEL-
HUNGARY:TWA 40 mg/m³;STEL 80 mg/m³;Skin OEL-THE NETHERLANDS:TWA 10 pp
m (50 mg/m³) OEL-THE PHILIPPINES:TWA 10 ppm (50 mg/m³) OEL-POLAND:TW
A 20 mg/m³ OEL-RUSSIA:STEL 20 mg/m³ OEL-SWITZERLAND:TWA 10 ppm (50 m
g/m³) OEL-UNITED KINGDOM:TWA 10 ppm (50 mg/m³);STEL 15 ppm (75 mg/m³)
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW
ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Material Safety Data Sheet

2-Naphthol, 98%

ACC# 97239

Section 1 - Chemical Product and Company Identification

MSDS Name: 2-Naphthol, 98%

Catalog Numbers: AC156970000, AC156970010, AC156970025

Synonyms: 2-Hydroxynaphthalene; 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
135-19-3	2-NAPHTHOL	98	205-182-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: slightly brown solid.

Danger! Highly toxic. May be fatal if inhaled. Causes eye, skin, and respiratory tract irritation. May be harmful if swallowed. Aspiration hazard if swallowed. Can enter lungs and cause damage. Light sensitive.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

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

Inhalation: May be fatal if inhaled. Causes respiratory tract irritation.

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

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. 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 water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: 400 deg C (752.00 deg F)

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: 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. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from heat and flame. Keep away from sources of ignition. Do not store in direct sunlight. Keep container closed when not in use. 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. Material darkens in color during storage.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2-NAPHTHOL	none listed	none listed	none listed

OSHA Vacated PELs: 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: Solid

Appearance: slightly brown

Odor: Slight phenolic

pH: Not available.

Vapor Pressure: 10 mm Hg @145.5

Vapor Density: 4.97 (air=1)

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 285 - 286 deg C @ 760.00mm Hg

Freezing/Melting Point:122 - 123 deg C

Decomposition Temperature:400 deg C

Solubility: 1 G/L WATER (20°C)

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.

Conditions to Avoid: Incompatible materials, light.

Incompatibilities with Other Materials: Strong oxidizing agents - strong bases - acid chlorides - acid anhydrides - concentrated sulfuric and nitric acids - antipyrine - camphor - phenol - ferric salts - menthol - urethane - potassium permanganate.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, toxic fumes of sodium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 135-19-3: QL2975000

LD50/LC50:

CAS# 135-19-3:

Draize test, rabbit, eye: 100 mg Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = >770 mg/m³/1H;

Oral, mouse: LD50 = 98 mg/kg;

Oral, rabbit: LD50 = 5400 mg/kg;

Oral, rat: LD50 = 1960 mg/kg;

Oral, rat: LD50 = 1980 mg/kg;

Skin, rabbit: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 135-19-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: Mutation data has been reported.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Fish toxicity:LC50 fathead minnow 3.5 mg/L/96HLC50 rainbow trout 0.12 mg/L/27day Invertebrate toxicity:LC50 Daphnia magna 3.5

mg/L/48HEC50 Selenastrum capricornutum 19 mg/L/4HEC50 Photobacterium phosphoreum 0.275 ppm/5-30 min Microtox test (The Dictionary of Substances and their Effects, 1992).

Environmental: Degradation studies:Biodegradable (The Dictionary of Substances and their Effects, 1992).

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.	No information available.
Hazard Class:	6.1	
UN Number:	UN2811	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 135-19-3 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 # 135-19-3: 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# 135-19-3 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 20/22 Harmful by inhalation and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 135-19-3: 2

Canada - DSL/NDSL

CAS# 135-19-3 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# 135-19-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

n-Hexane

ACC# 00731

Section 1 - Chemical Product and Company Identification

MSDS Name: n-Hexane

Catalog Numbers: AC160780000, AC160780010, AC160780025, AC160780250, AC160780251, AC197360000, AC197360050, AC197360250, AC2683600, AC326660000, AC326660010, AC326660025, AC326710000, AC326710010, AC326710025, AC326780000, AC326780010, AC326780025, AC326920000, AC326920010, AC326921000, AC326922500, AC327890000, AC327890010, AC364370000, AC364370010, AC364371000, AC383800000, AC383800010, AC383800025, AC383800050, AC620040000, AC620048000, 16078-0040, 19736-0010, 19736-0025, H306-1, H306-4, H3064LC, H306SK-4

Synonyms: Hexane; Hexyl hydride; Hex.

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
110-54-3	n-Hexane	93+	203-777-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: APHA: 20 max liquid. Flash Point: -22 deg C.

Danger! Flammable liquid and vapor. Danger of serious damage to health by prolonged exposure through inhalation. Breathing vapors may cause drowsiness and dizziness. Causes eye and skin irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Possible risk of impaired fertility. Aspiration hazard if swallowed. Can enter lungs and cause damage.

Target Organs: Blood, central nervous system, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be absorbed through the skin in harmful amounts. May cause dermatitis. There have been no reports of skin sensitization in people occupationally exposed to n-hexane. Skin sensitization was not observed in a maximization test using 25 volunteers.

Ingestion: Aspiration hazard. May cause irritation of the digestive tract. May be harmful if swallowed. May cause lung damage.

Inhalation: Harmful if inhaled. May cause respiratory tract irritation. Exposure produces central nervous system depression. Inhalation of vapors may cause drowsiness and dizziness. n-Hexane vapor concentrations can become so high that oxygen is displaced, especially in confined spaces.

Chronic: Chronic exposure may cause liver damage. Adverse reproductive effects have been reported in animals. 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.

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

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Possible aspiration hazard. 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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Containers may explode in the heat of a fire. Flammable liquid and vapor.

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

Flash Point: -22 deg C (-7.60 deg F)

Autoignition Temperature: 223 deg C (433.40 deg F)
Explosion Limits, Lower:1.1 vol %
Upper: 7.5 vol %
NFPA Rating: (estimated) Health: 2; Flammability: 3; 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. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Take precautionary measures against static discharges. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.
Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Flammables-area.

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 only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
n-Hexane	50 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	50 ppm TWA; 180 mg/m ³ TWA 1100 ppm IDLH (10% LEL)	500 ppm TWA; 1800 mg/m ³ TWA

OSHA Vacated PELs: n-Hexane: 50 ppm TWA; 180 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: 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 - APHA: 20 max

Odor: faint odor - peculiar odor

pH: Not available.

Vapor Pressure: 160 mbar @ 20 deg C

Vapor Density: 2.97(Air = 1)

Evaporation Rate:Not available.

Viscosity: 0.31 mPa @ 20 deg C

Boiling Point: 69 deg C @ 760 mmHg

Freezing/Melting Point:-95 deg C

Decomposition Temperature:Not available.

Solubility: Insoluble.

Specific Gravity/Density:0.659

Molecular Formula:C₆H₁₄

Molecular Weight:86.18

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light, ignition sources, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, fluorine, liquid chlorine, dinitrogen tetroxide, magnesium perchlorate.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 110-54-3: MN9275000

LD50/LC50:

CAS# 110-54-3:

Draize test, rabbit, eye: 10 mg Mild;

Inhalation, mouse: LC50 = 150000 mg/m³/2H;
Inhalation, rat: LC50 = 48000 ppm/4H;
Inhalation, rat: LC50 = 627000 mg/m³/3M;
Oral, rat: LD50 = 25 gm/kg;

Carcinogenicity:

CAS# 110-54-3: 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 experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Estimated BCF values = 2.24 and 2.89. These values suggest that hexane will show low bioconcentration in aquatic organisms. Estimated Koc value = 4.11. This product will show slight soil mobility and is expected to rapidly volatilize from moist surface soils.

Environmental: Terrestrial: Volatilization and adsorption are expected to be the most important fate processes. Aquatic: Photolysis or hydrolysis are not expected to be important. Atmospheric: Expected to exist entirely in the vapor phase in ambient air, expected half life 2.8 days. Expected to biodegrade but not bioconcentrate.

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:	HEXANES	HEXANES
Hazard Class:	3	3
UN Number:	UN1208	UN1208
Packing Group:	II	II
Additional Info:		FLASHPOINT -22 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 110-54-3 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.

CERCLA Hazardous Substances and corresponding RQs

CAS# 110-54-3: 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 # 110-54-3: immediate, delayed, fire.

Section 313

This material contains n-Hexane (CAS# 110-54-3, 93+%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 110-54-3 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# 110-54-3 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:

XN F N

Risk Phrases:

R 11 Highly flammable.

R 38 Irritating to skin.

R 48/20 Harmful : danger of serious damage to health by prolonged exposure through inhalation.

R 62 Possible risk of impaired fertility.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R 65 Harmful: may cause lung damage if swallowed.

R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

S 36/37 Wear suitable protective clothing and gloves.

S 9 Keep container in a well-ventilated place.

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

S 62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 110-54-3: 1

Canada - DSL/NDSL

CAS# 110-54-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, 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# 110-54-3 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Nitric acid, 20-70%

ACC# 16550

Section 1 - Chemical Product and Company Identification

MSDS Name: Nitric acid, 20-70%

Catalog Numbers: AC124660000, AC124660010, AC124660011, AC124660025, AC124660026, AC124665000, AC124665001, AC133620000, AC133620010, AC133620011, AC133620025, AC133620026, AC424000000, AC424000025, AC424000026, AC424000250, AC424005000, AC424005001, AC613205000, A198C-212, A198C4X-212, A200-212, A200-500, A200-500LC, A200-612GAL, A200212LC, A200C-212, A200C212EA, A200C212LC, A200C4X-212, A200C4X212L, A200S-212, A200S-500, A200S212LC, A200SI-212, A206C-212, A206C4X-212, A467-1, A467-2, A467-250, A467-500, A483-212, A509-212, A509-212LC, A509-500, A509SK-212, A509SK-212LC, MCC-030822, NC9596579, S719721, S71972SC

Synonyms: Azotic acid; Engraver's acid; Aqua fortis.

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	30-80	231-791-2
7697-37-2	Nitric acid	20-70	231-714-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear to yellow liquid.

Danger! May be fatal if inhaled. Causes severe eye and skin burns. Causes severe respiratory and digestive tract burns. Strong oxidizer. Contact with other material may

cause a fire. Acute pulmonary edema or chronic obstructive lung disease may occur from inhalation of the vapors of nitric acid. Corrosive to metal.

Target Organs: Lungs, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes severe eye burns. Direct contact with liquid may cause blindness or permanent eye damage.

Skin: Causes skin burns. May cause deep, penetrating ulcers of the skin. Concentrated nitric acid dyes human skin yellow on contact.

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.

Inhalation: Effects may be delayed. Causes chemical burns to the respiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. 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. Depending on the conditions, the vapor or fumes of nitric acid may actually be a mixture of nitric acid and various oxides of nitrogen. The composition may vary with temperature, humidity, and contact with other organic materials.

Chronic: Exposure to high concentrations of nitric acid vapor may cause pneumonitis and pulmonary edema which may be fatal. Symptoms may or may not be delayed. Continued exposure to the vapor & mist of nitric acid may result in a chronic bronchitis, & more severe exposure results in a chemical pneumonitis. The vapor & mists of nitric acid may erode the teeth, particularly affecting the canines & incisors.

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. 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. May react with metal surfaces to form flammable and explosive hydrogen gas. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

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: 4; 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: 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. Evacuate unnecessary personnel. Approach spill from upwind. Use water spray to cool and disperse vapors and protect personnel.

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. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Discard contaminated shoes. Do not use with metal spatula or other metal items. Use only with adequate ventilation or respiratory protection.

Storage: Do not store near combustible materials. Do not store in direct sunlight. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from metals. Store away from alkalies. Separate from organic materials. Inspect periodically for damage or evidence of leaks or corrosion.

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. Use a corrosion-

resistant ventilation system.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
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: 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 butyl rubber gloves, apron, and/or clothing.

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: Liquid

Appearance: clear to yellow

Odor: strong odor - acrid odor - suffocating odor

pH: 1.0 (0.1M soln)

Vapor Pressure: 51 mm Hg @ 25 deg C

Vapor Density: 2.17 (air=1)

Evaporation Rate: Not available.

Viscosity: 0.761 cps @ 25 deg C

Boiling Point: 86 deg C

Freezing/Melting Point: -42 deg C

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 1.4

Molecular Formula: HNO₃

Molecular Weight: 63.01

Section 10 - Stability and Reactivity

Chemical Stability: Stable. Decomposes when in contact with air, light, or organic matter. The yellow color is due to release of nitrogen dioxide on exposure to light.

Conditions to Avoid: High temperatures, light, confined spaces.

Incompatibilities with Other Materials: Metals, reducing agents, strong bases, acetic acid, alcohols, acetone, aniline, hydrogen sulfide, metal powders, carbides, aldehydes,

organic solvents, combustible materials, chromic acid, flammable liquids, cyanides, sulfides, Incompatible with many substances.

Hazardous Decomposition Products: Nitrogen oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 7697-37-2: QU5775000; QU5900000

LD50/LC50:

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# 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: 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: Terrestrial: During transport through the soil, nitric acid will dissolve some of the soil material, in particular, the carbonate based materials. The acid will be neutralized to some degree with adsorption of the proton also occurring on clay materials. However, significant amounts of acid are expected to remain for transport down toward the ground water table. Upon reaching the ground water table, the acid will continue to move, now in the direction of the ground water flow.

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:	NITRIC ACID	NITRIC ACID
Hazard Class:	8	8
UN Number:	UN2031	UN2031
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

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 # 7697-37-2: immediate, delayed, fire.

Section 313

This material contains Nitric acid (CAS# 7697-37-2, 20-70%), 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# 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# 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:

C

Risk Phrases:

R 35 Causes severe burns.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

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

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# 7732-18-5: No information available.

CAS# 7697-37-2: 1

Canada - DSL/NDSL

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 E, C, 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# 7697-37-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

n-Propyl acetate

ACC# 97171

Section 1 - Chemical Product and Company Identification

MSDS Name: n-Propyl acetate

Catalog Numbers: AC158290000, AC158290010, AC158290025, AC158290100, AC158291000, AC158295000, AC180840000, AC180840025, AC180840050, AC180845000, AC418410000, AC418410010, AC418410030, AC418410200, EK1083120, EK1083138

Synonyms: Acetic acid n-propyl ester; 1-Acetoxypropane.

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
109-60-4	n-Propyl acetate	90+	203-686-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: APHA: 15 max liquid. Flash Point: 10 deg C.

Danger! Flammable liquid and vapor. Causes eye, skin, and respiratory tract irritation. Breathing vapors may cause drowsiness and dizziness. Repeated exposure may cause skin dryness or cracking.

Target Organs: Blood, central nervous system, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes 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 gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. May cause central nervous system depression.

Inhalation: Causes respiratory tract irritation. May cause narcotic effects in high concentration. May be harmful if inhaled. Inhalation of vapors may cause drowsiness and dizziness.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. 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. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Containers may explode in the heat of a fire. Flammable liquid and vapor.

Extinguishing Media: Use water spray to cool fire-exposed containers. Use foam, dry chemical, or carbon dioxide. Water may be ineffective.

Flash Point: 10 deg C (50.00 deg F)

Autoignition Temperature: 450 deg C (842.00 deg F)

Explosion Limits, Lower: 1.8 vol %

Upper: 8 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 3; 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). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use spark-proof tools and explosion proof equipment. Do not get in eyes, on skin, or on clothing. Take precautionary measures against static discharges. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Flammables-area.

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 only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
n-Propyl acetate	200 ppm TWA; 250 ppm STEL	200 ppm TWA; 840 mg/m ³ TWA 1700 ppm IDLH	200 ppm TWA; 840 mg/m ³ TWA

OSHA Vacated PELs: n-Propyl acetate: 200 ppm TWA; 840 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: 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 - APHA: 15 max

Odor: odor of pears

pH: Not available.

Vapor Pressure: 33 mbar @ 20 deg C

Vapor Density: 3.5 (air=1)

Evaporation Rate:Not available.
Viscosity: 0.58 mPa @ 20 deg C
Boiling Point: 102 deg C @ 760 mmHg
Freezing/Melting Point:-95 deg C
Decomposition Temperature:Not available.
Solubility: Soluble.
Specific Gravity/Density:0.880
Molecular Formula:C5H10O2
Molecular Weight:102.13

Section 10 - Stability and Reactivity

Chemical Stability: Moisture sensitive.
Conditions to Avoid: Incompatible materials, ignition sources, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, acids, bases.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 109-60-4: AJ3675000

LD50/LC50:

CAS# 109-60-4:

Draize test, rabbit, eye: 500 mg/24H Mild;
Oral, mouse: LD50 = 8300 mg/kg;
Oral, rabbit: LD50 = 6640 mg/kg;
Oral, rat: LD50 = 9370 mg/kg;
Skin, rabbit: LD50 = >20 mL/kg;

Carcinogenicity:

CAS# 109-60-4: 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: Fish: Fathead Minnow: 60mg/L; 96H; No data available.

Environmental: Terrestrial: Expected to have high mobility in soil. Volatilization is expected from moist soil surfaces. Aquatic: Not expected to adsorb to suspended solids and sediment in water. Expected to volatilize from water surfaces. Atmospheric: Expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; half-life estimated to be about 5 days. Expected to slightly biodegrade and bioconcentrate.

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:	N-PROPYL ACETATE	N-PROPYL ACETATE
Hazard Class:	3	3
UN Number:	UN1276	UN1276
Packing Group:	II	II
Additional Info:		FLASHPOINT 10 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 109-60-4 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 # 109-60-4: 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# 109-60-4 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 F

Risk Phrases:

R 11 Highly flammable.

R 36 Irritating to eyes.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

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

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

WGK (Water Danger/Protection)

CAS# 109-60-4: 1

Canada - DSL/NDSL

CAS# 109-60-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, 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# 109-60-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Octylamine

ACC# 76599

Section 1 - Chemical Product and Company Identification

MSDS Name: Octylamine

Catalog Numbers: AC416420000, AC416421000, AC416425000

Synonyms: 1-Octanamine

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
111-86-4	Octylamine	99+	203-916-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available.

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: Not available.

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: Not available.

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.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: 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.

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: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

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.

Section 7 - Handling and Storage

Handling: Not available.

Storage: Not available.

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
Octylamine	none listed	none listed	none listed

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

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: Not available.

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: Not available.

Appearance: Not available.

Odor: None reported.

pH: Not available.

Vapor Pressure: 1 mbar @ 20 C

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: Not available.

Specific Gravity/Density:.7800g/cm3

Molecular Formula:CH₃(CH₂)₇NH₂

Molecular Weight:129.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Not available.

Incompatibilities with Other Materials: Strong oxidizing agents - strong acids - acid chlorides - acid anhydrides.

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

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 111-86-4: RG8050000

LD50/LC50:

CAS# 111-86-4:

Draize test, rabbit, eye: 100 mg/24H Severe;

Carcinogenicity:

CAS# 111-86-4: 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:	AMINES, LIQUID, CORROSIVE, FLAMMABLE, N. O.S.*	No information available.
Hazard Class:	8	

UN Number:	UN2734	
Packing Group:	I	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 111-86-4 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 # 111-86-4: 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# 111-86-4 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:

C

Risk Phrases:

- R 22 Harmful if swallowed.
- R 35 Causes severe burns.

Safety Phrases:

- S 23 Do not inhale gas/fumes/vapour/spray.
- 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# 111-86-4: 2

Canada - DSL/NDSL

CAS# 111-86-4 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

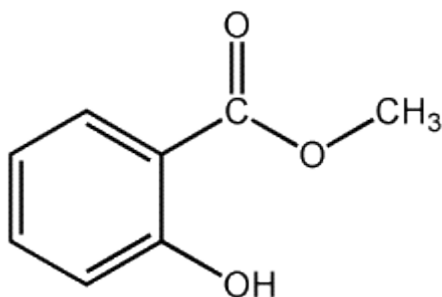
Methyl salicylate

- 2-Hydroxybenzoic acid, methyl ester
- Methoxybenzoic Acid
- Sweet birch oil
- Wintergreen oil
- Methyl 2-hydroxybenzoate

Formula

C₈H₈O₃

Structure



Description

Colorless yellowish or reddish liquid with odor of wintergreen.

Uses

Oil: in fern and cypress type perfumes & in toothpaste.

Registry Numbers and Inventories.

CAS	119-36-8
NIH PubChem CID	4133
EC (EINECS/ELINCS)	204-317-7
EC Class	R: 22-36/38, S: 26-36/37/39
RTECS	VO4725000
RTECS class	Mutagen; Reproductive Effector; Human Data; Primary Irritant
Merck	12,6200
Beilstein/Gmelin	971516
Beilstein Reference	4-10-00-00143
EPA OPP	76601
FEMA	2745
Swiss Giftliste 1	G-2532
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	C8H8O3
Formula mass	152.15
Melting point, °C	100 - 101
Boiling point, °C	432
Vapor pressure, mmHg	0.03
Vapor density (air=1)	5.24
Evaporization number	1 (butyl acetate=1)
Density	1.1969 g/cm ³ (0 C)
Solubility in water	Slightly soluble
Viscosity	1.54 cp (25 C)
Surface tension	44.2 g/s ² (-232 C)
Refractive index	1.53434 (12 C)
pKa/pKb	9.8 (pKa)
Partition coefficient, pK_{ow}	2.55
Heat of vaporization	46.70 kJ/mol
Heat of combustion	-3763 kJ/mol

Hazards and Protection.

Storage	Keep from contact with oxidizing materials. 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. Ground and bond containers when transferring material. 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 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	Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, using the appropriate protective equipment. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Provide ventilation.

Stability	Stable at room temperature in closed containers under normal storage and handling conditions.
Incompatibilities	Strong oxidizing agents, strong bases.
Decomposition	Carbon monoxide, carbon dioxide, salicyclic acid.

Fire.

Flash Point, °C	96
Autoignition, °C	455
Upper exp. limit, %	7.2
Lower exp. limit, %	1.2

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 water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated. Extinguishing media: Water or foam may cause frothing. Use carbon dioxide or dry chemical. Cool containers with flooding quantities of water until well after fire is out.

Fire potential This chemical is combustible.

NFPA	Health	2
	Flammability	1
	Reactivity	0

Health.

Poison_Class 4

Exposure effects May cause liver and kidney damage. Repeated exposure may cause metabolic disturbances.

Ingestion May cause nausea and vomiting. May be harmful if swallowed. Systemic effects of exposure include initial stimulation and later central nervous system depression. Symptoms include convulsions, respiratory failure, cardiac collapse, and possible death.

Inhalation Causes respiratory tract irritation. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause effects similar to those described for ingestion. May cause lung damage.

Skin Causes moderate skin irritation. May be absorbed through the skin in harmful amounts.

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. Get medical aid immediately. Call a poison control center.

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

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. 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.

USCG CHRIS Code	MES
<u>USCG Compatatibility Group</u>	34 Esters
IMO Chemical Code	17
IMO Pollution Category	B
IMO Hazard code	P

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Material Safety Data Sheet

Oxalic acid dihydrate

ACC# 17361

Section 1 - Chemical Product and Company Identification

MSDS Name: Oxalic acid dihydrate

Catalog Numbers: AC129600000, AC129600010, AC129601000, AC388100000, AC423150000, AC423150010, AC423150050, S80113, A218-3, A218-500, A219-250, A219-3, A219-50, A219-500, A219J500, NC9443441, NC9667432

Synonyms: Ethanedioic acid 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
6153-56-6	Oxalic acid dihydrate	>99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Danger! Causes burns by all exposure routes. Harmful if swallowed, inhaled, or absorbed through the skin. Possible risk of harm to the unborn child. May cause kidney damage.

Target Organs: Kidneys, heart, eyes, skin, brain, nerves, mucous membranes.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury. Causes redness and pain.

Skin: Harmful if absorbed through the skin. Causes severe skin irritation and possible burns. Rare chemical burns may occur from oxalic acid and may cause hypocalcemia.

Gangrene has occurred in the hands of people working with oxalic acid solutions without

rubber gloves. The skin lesions are characterized by cracking of the skin and the development of slow-healing ulcers. The skin may be bluish in color, and the nails brittle and yellow.

Ingestion: Causes gastrointestinal tract burns. Oxalic acid is toxic because of its acidic and chelating properties. It is especially toxic when ingested. As little as 5 grams (71 mg/kg) may be fatal. 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. Oxalic acid can bind calcium to form calcium oxalate which is insoluble at physiological pH. Calcium oxalate thus formed might precipitate in the kidney tubules and the brain. Hypocalcemia secondary to calcium oxalate formation might disturb the function of the heart and nerves.

Inhalation: Causes chemical burns to the respiratory tract. 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 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: 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 alcohol-resistant

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. 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. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Discard contaminated shoes. 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.

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
Oxalic acid dihydrate	none listed	none listed	none listed
Oxalic acid, anhydrous	1 mg/m ³ TWA; 2 mg/m ³ STEL	1 mg/m ³ TWA 500 mg/m ³ IDLH	1 mg/m ³ TWA

OSHA Vacated PELs: Oxalic acid dihydrate: No OSHA Vacated PELs are listed for this chemical. Oxalic acid, anhydrous: 1 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: Powder

Appearance: white

Odor: odorless

pH: 1.3 (0.1M soln)

Vapor Pressure: .92 mm Hg @ 60 deg C

Vapor Density: 4.62

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: 101 deg C

Decomposition Temperature: Not available.

Solubility: Moderately Soluble. 1g/7ml

Specific Gravity/Density: 1.653 @ 18.5°C

Molecular Formula: C₂H₂O₄·2H₂O

Molecular Weight: 126.04

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, mercury, hypochlorite, silver, strong alkalis, chlorites, furfuryl alcohol.

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

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6153-56-6 unlisted.

CAS# 144-62-7: RO2450000

LD50/LC50:

Not available.

CAS# 144-62-7:

Draize test, rabbit, eye: 250 ug/24H Severe;
Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, rat: LD50 = 7500 mg/kg;

Carcinogenicity:

CAS# 6153-56-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 144-62-7: 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

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 4000 mg/L; 24 Hr.; Static Conditions
Fish: Mosquito Fish: LC50 = 1350 mg/L; 24 Hr.; Static Conditions
No data available.

Environmental: An estimated Koc value of 5 for oxalic acid indicates high mobility in soil and oxalic acid has been detected in groundwater. Several screening studies and grab sample tests indicate that under aerobic and anaerobic conditions, oxalic acid will readily biodegrade in aquatic ecosystems. Based on an experimental Henry's Law constant of 1.4×10^{-10} atm-m³/mole at 25°C, oxalic acid is expected to be essentially nonvolatile from water. Adsorption to sediment and bioconcentration in aquatic organisms may not be important fate process for oxalic acid.

Physical: Oxalic acid in the ambient atmosphere may react slowly with OH radicals, but it is removed rapidly by photolysis; the daytime persistence of oxalic acid is not expected to exceed a few hours. Based on its high water solubility, removal from air via wet deposition is likely to occur. Oxalic acid may also be removed from air via dry deposition with 11% of the total deposition being dry deposition.

Other: Based on an average experimental water solubility of 220,000 mg/L at 25°C and a regression derived equation, the BCF for oxalic acid can be estimated to be approximately 0.6 and therefore should not be expected to bioconcentrate in aquatic organisms.

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 SOLIDS, TOXIC, N.O.S.
Hazard Class:	8	8
UN Number:	UN2923	UN2923
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6153-56-6 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# 144-62-7 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 TPQ.

SARA Codes

CAS # 6153-56-6: immediate, delayed.

CAS # 144-62-7: 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# 6153-56-6 can be found on the following state right to know lists: Pennsylvania.

CAS# 144-62-7 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:

C

Risk Phrases:

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

R 35 Causes severe burns.

R 63 Possible risk of harm to the unborn child.

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# 6153-56-6: 1

CAS# 144-62-7: 1

Canada - DSL/NDSL

CAS# 144-62-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E, 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# 144-62-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

o-Xylene

ACC# 17180

Section 1 - Chemical Product and Company Identification

MSDS Name: o-Xylene

Catalog Numbers: A4926551, A4926558, D05081500, NC9698851, NC9932825, O5081-4, XXO508120LI

Synonyms: 1,2-Dimethylbenzene.

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
95-47-6	o-Xylene	>98	202-422-2

Hazard Symbols: XN F

Risk Phrases: 11 20/21 38

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. **Flammable liquid and vapor.** May cause central nervous system depression. May cause liver and kidney damage. Aspiration hazard if swallowed. Can enter lungs and cause damage. Causes respiratory tract irritation.

Warning! Causes eye irritation. Prolonged or repeated contact may dry the skin and cause irritation. May be harmful if absorbed through skin or if inhaled. This substance has caused adverse reproductive and fetal effects in animals.

Target Organs: Blood, kidneys, central nervous system, liver, lungs, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes severe eye irritation. Splashes of xylene in human eyes generally cause transient superficial injury.

Skin: May be harmful if absorbed through the skin. Xylene contact causes defatting of the skin with irritation, dryness, and cracking. Blistering may occur, particularly if exposure to concentrated xylene is prolonged and the exposed area of skin is occluded.

Ingestion: Aspiration hazard. May cause irritation of the digestive tract. 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 effects similar to those of acute inhalation.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Prolonged exposure may result in dizziness and general weakness. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause liver and kidney damage. Causes irritation of mucous membrane. Exposure may cause blood abnormalities. Odor is not an adequate warning for overexposure to xylene.

Chronic: Chronic exposure to xylene may cause defatting dermatitis, reversible eye damage, dyspnea (labored breathing), confusion, dizziness, apprehension, memory loss, headache, tremors, weakness, anorexia, nausea, ringing in the ears, irritability, thirst, mild changes in liver function, kidney impairment, anemia, and hyperplasia, but not destruction, of the bone marrow.

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: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless 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. Flammable liquid and vapor. Vapors may form an explosive mixture with air. 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. This liquid floats on water and may travel to a source of ignition and spread fire. May accumulate static electricity.

Extinguishing Media: Use water spray to cool fire-exposed containers. Water may be

ineffective. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 87-90 deg F

Autoignition Temperature: 867 deg F (463.89 deg C)

Explosion Limits, Lower:0.9%

Upper: 6.7%

NFPA Rating: (estimated) Health: 2; Flammability: 3; 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. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces. U.S. regulations require reporting spills and releases to soil, water and air in excess of reportable quantities. This material creates a fire hazard because it floats on water. If possible, try to contain floating material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid breathing vapor or mist.

Storage: Keep away from sources of ignition. Keep container closed when not in use. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. 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 general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
o-Xylene	100 ppm TWA; 150 ppm STEL	100 ppm TWA; 435 mg/m ³ TWA 900 ppm	none listed

		IDLH	
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OSHA Vacated PELs: o-Xylene: 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: clear, colorless

Odor: aromatic odor

pH: Not applicable.

Vapor Pressure: 6.72 mm Hg @ 21 deg C

Vapor Density: 3.66 (air=1)

Evaporation Rate:0.7 (butyl acetate=1)

Viscosity: <32.6 SUS

Boiling Point: 291 deg F

Freezing/Melting Point:-13 deg F

Decomposition Temperature:Not available.

Solubility: Insoluble.

Specific Gravity/Density:0.87 (water=1)

Molecular Formula:C₈H₁₀

Molecular Weight:106.17

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, ignition sources.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, acetic acid, nitric acid.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:**CAS#** 95-47-6: ZE2450000**LD50/LC50:**

Not available.

Carcinogenicity:

CAS# 95-47-6:

ACGIH: A4 - Not Classifiable as a Human Carcinogen**IARC:** IARC Group 3 - not classifiable (listed as Xylenes (o-, m-, p- isomers)).**Epidemiology:** No information available.**Teratogenicity:** No information available.**Reproductive Effects:** There is ample evidence that xylene produces embryotoxicity (reduced body weight, retarded ossification, retarded kidney development, increased extra rib) and fetotoxicity in mice and rats, but xylene is not considered teratogenic.**Neurotoxicity:** No information available.**Mutagenicity:** No information available.**Other Studies:** Standard Draize Test: Administration into the eye (rabbit) = 5 mg/24H (Severe). Standard Draize Test: Administration onto the skin (rabbit) = 500 mg (Moderate).

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 13.5 mg/L; 96 Hr; Unspecified Goldfish: LD50 = 13 mg/L; 24 Hr; Unspecified Fathead Minnow: LC50 = 46 mg/L; 1 Hr; Static bioassay Acute and long-term toxicity to fish and invertebrates: LD50 for goldfish is 13 mg/L/24 Hr. Cas#1330-20-7: LC50(96Hr.) rainbow trout = 8.05 mg/L, Static condition; LC50(96Hr.) fathead minnow = 16.1 mg/L, flow-through conditions; LC50(96Hr.) bluegill = 16.1 mg/L, flow-through; EC50 (48 Hr.) water flea = 3.82 mg/L, flow-through conditions; EC50(24 Hr.) photobacterium phosphoreum = 0.0084 mg/L, Microtox test.

Environmental: In air, xylenes degrade by reacting with photochemically produced hydroxyl radicals. In soil it will volatilize and leach into groundwater. Little bioconcentration is expected.

Physical: ATMOSPHERIC FATE: According to a model of gas/particle partitioning of semivolatile organic compounds in the atmosphere, xylene, which has an experimental vapor pressure of 7.99 mm Hg at 25 deg C, will exist solely as a vapor in the ambient atmosphere. Vapor-phase xylene is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the atmospheric lifetime of xylene is about 14-26 hours. Ambient levels of xylene are detected in the atmosphere due to large emissions of this compound.

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:	XYLENES				XYLENE
Hazard Class:	3				3(9.2)
UN Number:	UN1307				UN1307
Packing Group:	II				III
Additional Info:					FLASHPOINT 32C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 95-47-6 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 95-47-6: Effective Date: 10/4/82; Sunset Date: 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.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 95-47-6: 1000 lb final RQ (Listed under Xylene, mixed); 454 kg final RQ (Listed under

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 95-47-6: acute, chronic, flammable.

Section 313

This material contains o-Xylene (CAS# 95-47-6, 98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 95-47-6 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# 95-47-6 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# 95-47-6 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:**

XN F

Risk Phrases:

R 11 Highly flammable.

R 20/21 Harmful by inhalation and in contact with skin.

R 38 Irritating to skin.

Safety Phrases:

S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 95-47-6: 2

Canada - DSL/NDSL

CAS# 95-47-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2B.

Canadian Ingredient Disclosure List

CAS# 95-47-6 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 95-47-6 (listed as xylenes (o-, m-, p- isomers)): OEL-ARAB Republic of Egypt:TWA 0.5 ppm (0.9 mg/m³) OEL-AUSTRALIA:TWA 80 ppm (330 mg/m³);STEL 150 ppm (655 mg/m³) OEL-BELGIUM:TWA 100 ppm (434 mg/m³);STEL 150 ppm (651 mg/m³) OEL-CZECHOSLOVAKIA:TWA 200 mg/m³;STEL 1000 mg/m³ OEL-DENMARK:TWA 50 ppm (217 mg/m³);Skin OEL-FINLAND:TWA 100 ppm (435 mg/m³);STEL 150 ppm;Skin OEL-FRANCE:TWA 100 ppm (435 mg/m³);STEL 150 ppm (650 mg/m³) OEL-GERMANY:TWA 100 ppm (440 mg/m³) OEL-HUNGARY:TWA 100 mg/m³;STEL 300 mg/m³ OEL-JAPAN:TWA 100 ppm (430 mg/m³) OEL-THE NETHERLANDS:TWA 100 ppm (435 mg/m³);Skin OEL-THE PHILIPPINES:TWA 0.1 mg/m³ OEL-POLAND:TWA 100 mg/m³ OEL-SWEDEN:TWA 50 ppm (200 mg/m³);STEL 100 ppm (450 mg/m³);Skin OEL-SWITZERLAND:TWA 100 ppm (436 mg/m³);STEL 200 ppm (870 mg/m³) OEL-THAILAND:TWA 100 ppm (435 mg/m³) OEL-TURKEY:TWA 100 ppm (435 mg/m³) OEL-UNITED KINGDOM:TWA 100 ppm (435 mg/m³);STEL 150 ppm;Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check AC GIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Material Safety Data Sheet

n-Pentadecane, 99%

ACC# 57265

Section 1 - Chemical Product and Company Identification

MSDS Name: n-Pentadecane, 99%

Catalog Numbers: AC129820000, AC129820250, AC129822500

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
629-62-9	n-Pentadecane	99	211-098-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Clear liquid.

Warning! May cause eye, skin, and respiratory tract irritation. Repeated exposure may cause skin dryness or cracking. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause central nervous system depression. May cause liver damage.

Target Organs: Central nervous system, liver.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Aspiration hazard. May cause irritation of the digestive tract. May cause liver 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. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. When aspirated into the lungs, are asphyxiants similar to the C6 to C10 members, but cause death more slowly.

Inhalation: May cause respiratory tract irritation. May cause drowsiness, unconsciousness, and central nervous system depression.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. 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.

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

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward.

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: Use foam, dry chemical, or carbon dioxide.

Flash Point: 132 deg C (269.60 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:0.45%

Upper: 6.5%

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. Use with adequate ventilation. 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.

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
n-Pentadecane	none listed	none listed	none listed
Alkanes, C12-26-branched and linear	none listed	none listed	none listed

OSHA Vacated PELs: n-Pentadecane: No OSHA Vacated PELs are listed for this chemical.

Alkanes, C12-26-branched and linear: 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

Odor: Not available.

pH: Not available.

Vapor Pressure: 1 mm Hg @ 92 deg C

Vapor Density: 7.4 (air=1)

Evaporation Rate: Not available.

Viscosity: 37.0

Boiling Point: 270 deg C @ 760 mm Hg

Freezing/Melting Point: 9.9 deg C

Decomposition Temperature: Not available.

Solubility: insoluble
Specific Gravity/Density: .7690g/cm³
Molecular Formula: C₁₅H₃₂
Molecular Weight: 212.42

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: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 629-62-9: RZ1800000
CAS# 90622-53-0 unlisted.
LD50/LC50:
Not available.
Not available.

Carcinogenicity:
CAS# 629-62-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 90622-53-0: 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# 629-62-9 is listed on the TSCA inventory.

CAS# 90622-53-0 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# 629-62-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 90622-53-0 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 65 Harmful: may cause lung damage if swallowed.

R 66 Repeated exposure may cause skin dryness or cracking.

Safety Phrases:

S 62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 629-62-9: No information available.

CAS# 90622-53-0: 0

Canada - DSL/NDSL

CAS# 629-62-9 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

Material Safety Data Sheet

Phenol Red Free Acid

ACC# 18391

Section 1 - Chemical Product and Company Identification

MSDS Name: Phenol Red Free Acid

Catalog Numbers: S71430, S71432, S93322, P74-10, S71431

Synonyms: Phenolsulfonphthalein; Phenolsulphonphthalein; Sulfonphthal; Sulphonphthal

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
143-74-8	Phenol red	ca. 100	205-609-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red solid.

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

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical 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: 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 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: 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. Use with adequate ventilation. Avoid contact with skin and eyes. 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 ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Phenol red	none listed	none listed	none listed

OSHA Vacated PELs: Phenol 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: red

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: > 300 deg C

Decomposition Temperature: Not available.

Solubility: Slightly soluble in water

Specific Gravity/Density: Not available.

Molecular Formula: C₁₉H₁₄O₅S

Molecular Weight: 354.155

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: Carbon monoxide, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 143-74-8: SJ7490000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 143-74-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Please refer to RTECS# SJ7490000 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# 143-74-8 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 # 143-74-8: 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# 143-74-8 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# 143-74-8: No information available.

Canada - DSL/NDSL

CAS# 143-74-8 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

Phenolphthalein

ACC# 18390

Section 1 - Chemical Product and Company Identification

MSDS Name: Phenolphthalein

Catalog Numbers: AC147710000, AC147711000, AC147715000, AC417180000, AC417180025, AC417181000, AC417185000, S76958, S76961, S93324, P79-100, P79-500, S71428

Synonyms: 3,3-Bis(4-Hydroxyphenyl)-1(3H)-Isobenzofuranone; 3,3-Bis(p-Hydroxyphenyl)Phthalide; Alpha-Di(p-Hydroxyphenyl)phthalide

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
77-09-8	Phenolphthalein	100	201-004-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: off-white crystalline powder.

Caution! Possible cancer hazard. May cause cancer based on animal data. May cause eye, skin, and respiratory tract irritation. May be harmful if swallowed. 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: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion may cause fever, blood pressure increase and other unspecified vascular effects. Major danger of overdosage is fluid and electrolyte deficits resulting from excessive laxative effect.

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

Chronic: Possible cancer hazard based on tests with laboratory animals.

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.

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: 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. 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 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.

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
Phenolphthalein	none listed	none listed	none listed

OSHA Vacated PELs: Phenolphthalein: 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: off-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:258 - 263 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble in water.
Specific Gravity/Density:1.299
Molecular Formula:C20H14O4
Molecular Weight:318.0956

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 dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 77-09-8: SM8380000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 77-09-8:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/15/98
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

Epidemiology: Doses associated with fatalities have been 1.8 grams and 0.65-1.3 grams.
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# 77-09-8 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 # 77-09-8: 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# 77-09-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

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 Phenolphthalein, 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 22 Harmful if swallowed.

R 40 Limited evidence of a carcinogenic effect.

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# 77-09-8: 1

Canada - DSL/NDSL

CAS# 77-09-8 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

Material Safety Data Sheet

Polyphosphoric acid

ACC# 40328

Section 1 - Chemical Product and Company Identification

MSDS Name: Polyphosphoric acid

Catalog Numbers: AC196950000, AC196950010, AC196950025, AC196950250, AC364680000

Synonyms: Superphosphoric 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
8017-16-1	Polyphosphoric acid	84+	232-417-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid.

Danger! Causes burns by all exposure routes.

Target Organs: Respiratory system, gastrointestinal system, eyes, skin.

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: Causes gastrointestinal tract burns. Causes severe pain, nausea, vomiting, diarrhea, and shock. May cause hemorrhaging of the digestive tract. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract.

Inhalation: Irritation may lead to chemical pneumonitis and pulmonary edema. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. Causes chemical burns to the respiratory tract.

Chronic: Prolonged inhalation may cause respiratory tract inflammation and lung damage.

Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis.

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. 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: 3; Flammability: 0; 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.

Storage: Store in a cool, dry place. Store in a tightly closed container. Corrosives area. 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
Polyphosphoric acid	none listed	none listed	none listed
Phosphoric acid	1 mg/m ³ TWA; 3 mg/m ³ STEL	1 mg/m ³ TWA 1000 mg/m ³ IDLH	1 mg/m ³ TWA

OSHA Vacated PELs: Polyphosphoric acid: No OSHA Vacated PELs are listed for this chemical. Phosphoric acid: 1 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: 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

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 3.4 (air=1)

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 550 deg C @ 760 mmHg

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: May decompose.
Specific Gravity/Density:2.050
Molecular Formula:Not applicable.
Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: May decompose on exposure to moist air or water.
Conditions to Avoid: Incompatible materials, metals, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Metals, strong bases, alcohols, water, chlorates, nitrates, Water reactive substances..
Hazardous Decomposition Products: Phosphine, oxides of phosphorus, hydrogen gas.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 8017-16-1 unlisted.
CAS# 7664-38-2: TB6300000
LD50/LC50:
Not available.

CAS# 7664-38-2:
Draize test, rabbit, eye: 119 mg Severe;
Draize test, rabbit, skin: 595 mg/24H Severe;
Inhalation, mouse: LC50 = 25.5 mg/m³;
Inhalation, rat: LC50 = >850 mg/m³/1H;
Inhalation, rat: LC50 = 25.5 mg/m³;
Oral, mouse: LD50 = 1.25 gm/kg;
Oral, rat: LD50 = 1530 mg/kg;
Oral, rat: LD50 = 1.25 gm/kg;
Skin, rabbit: LD50 = 2740 mg/kg;

Carcinogenicity:
CAS# 8017-16-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7664-38-2: 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: Fish: Mosquito Fish: LC50 = 138 mg/L; 96 Hr; Unspecified No data available.

Environmental: The acidity of phosphoric acid may be reduced readily by natural water hardness minerals, but the phosphate may persist indefinitely. During transport through the soil, phosphoric acid will dissolve some of the soil material, in particular, carbonate-based materials. The acid will be neutralized to some degree with adsorption of the proton and phosphate ions also possible. However, significant amounts of acid will remain for transport down toward the groundwater table.

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:	PHOSPHORIC ACID SOLUTION	PHOSPHORIC ACID SOLUTION
Hazard Class:	8	8
UN Number:	UN1805	UN1805
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 8017-16-1 is listed on the TSCA inventory.

CAS# 7664-38-2 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# 7664-38-2: 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 # 8017-16-1: immediate.

CAS # 7664-38-2: 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:

CAS# 7664-38-2 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:

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

STATE

CAS# 8017-16-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7664-38-2 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:

C

Risk Phrases:

R 34 Causes burns.

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# 8017-16-1: 1

CAS# 7664-38-2: 1

Canada - DSL/NDSL

CAS# 8017-16-1 is listed on Canada's DSL List.

CAS# 7664-38-2 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# 7664-38-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Polyvinyl alcohol, 75 - 100% hydrolyzed, M.W. 2000 - 95000
ACC# 19153

Section 1 - Chemical Product and Company Identification

MSDS Name: Polyvinyl alcohol, 75 - 100% hydrolyzed, M.W. 2000 - 95000

Catalog Numbers: AC180300000, AC180300010, AC180300250, AC180305000, AC183130000, AC183130010, AC183130250, AC183135000, AC183150000, AC183150250, AC183152500, AC183290000, AC183290010, AC183290250, AC183295000, AC183300000, AC183300050, AC183300250, AC183301000, AC183302500, AC302780000, AC302780250, AC302782500, AC418120000, AC418120010, AC418120250, S72223B, S80128-2, S80128-3, S93327, S93328

Synonyms: PVA; Poly(vinyl alcohol); Alkotex; Covol; Gelvatol; Lemol; Vinol.

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
9002-89-5	Polyvinyl alcohol	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: cream 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. Will burn if involved in a fire.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: > 113 deg C (> 235.40 deg F)
Autoignition Temperature: Not applicable.
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. 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
Polyvinyl alcohol	none listed	none listed	none listed

OSHA Vacated PELs: Polyvinyl alcohol: 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 - slightly yellow - cream

Odor: none reported

pH: 5 - 7 (4% aq sol @ 20°C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: 4-35mPa (4%aq.sol (20 deg

Boiling Point: Not available.

Freezing/Melting Point:200 deg C

Decomposition Temperature:228 deg C

Solubility: soluble

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, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, bases, sodium hypochlorite, calcium hypochlorite, phosphates.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 9002-89-5: TR8100000; TR8101000

LD50/LC50:

CAS# 9002-89-5:

Oral, mouse: LD50 = 14700 mg/kg;

Oral, mouse: LD50 = 14270 mg/kg;

Oral, rat: LD50 = >20 gm/kg;

Oral, rat: LD50 = 23854 mg/kg;

Carcinogenicity:

CAS# 9002-89-5: 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: 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# 9002-89-5 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 # 9002-89-5: 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# 9002-89-5 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# 9002-89-5: 1

Canada - DSL/NDSL

CAS# 9002-89-5 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

Material Safety Data Sheet

Potassium Bromate, 99+%

ACC# 96402

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium Bromate, 99+%

Catalog Numbers: AC208850000, AC208850050, AC208855000

Synonyms: Bromic Acid, Potassium 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
7758-01-2	Potassium Bromate	>99	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	POTASSIUM BROMATE
Hazard Class:	5.1	5.1
UN Number:	UN1484	UN1484
Packing Group:	II	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, >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# 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 does not have a WHMIS classification.

Canadian Ingredient Disclosure List

