

Material Safety Data Sheets, Carver Hall RM 208-A

ACTIVATED-ALUMINAS, S-100 -- 6810-00N080933

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

Product ID:ACTIVATED-ALUMINAS, S-100
MSDS Date:06/28/1991
FSC:6810
NIIN:00N080933
MSDS Number: CFTSX
=== Responsible Party ===
Company Name:ALCOA
Box:300
City:BAUXITE
State:AR
ZIP:72011
Country:US
Info Phone Num:412-553-2881
Emergency Phone Num:412-553-4001;800-424-9300 (CHEMTREC)
CAGE:EO093

==== Contractor Identification ===

Company Name:ALCOA
Box:300
CAGE:EO093
Company Name:ALUMINUM CO OF AMERICA INDUSTRIAL CHEM DIV
Address:HWY 88 (ALUM CO AM BAAUXITE AROLD)
Box:300
City:BAUXITE
State:AR
ZIP:72011
Country:US
Phone:501-776-4663
CAGE:4H413

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

Ingred Name:ALUMINUM OXIDE (2:3) (SARA 313)
CAS:1344-28-1
RTECS #:BD1200000
Fraction by Wt: 90-97%
OSHA PEL:15 MG/M3 TDUST
ACGIH TLV:10 MG/M3 TDUST

Ingred Name:SODIUM MONOXIDE; (SODIUM OXIDE)
CAS:12401-86-4
RTECS #:WC4800000
Fraction by Wt: 0.3-0.5%
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:SILICA, CRYSTALLINE-FUSED; (SILICON DIOXIDE). %:0.01-0.2.
LD50:(ORAL,RAT) 3160 MG/KG BODY WEIGHT.
CAS:60676-86-0
RTECS #:VV7328000
Fraction by Wt: <0.2%
OSHA PEL:10,5 MG/M3 RESP(MFR)
ACGIH TLV:10 MG/M3 TDUST (MFR)

Ingred Name:IRON OXIDE. %:0.03-0.1.
CAS:1332-37-2

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RTECS #:NO7380000
Fraction by Wt: <0.1%
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:WATER; (LOSS ON IGNITION)
CAS:7732-18-5
RTECS #:ZC0110000
Fraction by Wt: 4-7%
OSHA PEL:N/K
ACGIH TLV:N/K

==== Hazards Identification =====

LD50 LC50 Mixture:SEE INGREDIENT 3.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:YES OSHA:NO
Health Hazards Acute and Chronic:THE DESICCANT PROPERTIES OF ALCOS
ACTIVATED ALUMINA MAY CAUSE IRRITATION TO THE EYES AND UPPER
RESPIRATORY TRACT.
Explanation of Carcinogenicity:SILICA, CRYSTALLINE-FUSED:IARC
MONOGRAPHS, VOL 68, 1997:GROUP 1.
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

==== 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:USE NIOSH APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT .
Unusual Fire/Explosion Hazard:PRODUCT IS NON-FLAMMABLE. NOT AN
EXPLOSION HAZARD.

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

Spill Release Procedures:CLEAN UP USING DRY PROCEDURES; AVOID DUSTING.
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:WHERE EXPOSURE LIMIT IS OR MAY BE EXCEEDED, USE
NIOSH APPROVED RESPIRATORY PROTECTION. SELECT APPROPRIATE
RESPIRATOR (DUST RESPIRATOR) BASED ON ACTUAL OR POTENTIAL AIRBORNE
CONTAMINANTS & THEIR CONCEN TRATIONS PRESENT.
Ventilation:USE W/ADEQUATE VENTILATION TO MEET EXPOSURE LIMITS AS
LISTED IN INGREDIENTS SECTION.

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Protective Gloves: IMPERVIOUS GLOVES .
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS .
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET
ANSI DESIGN CRITERIA .
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
PH: -10 (20% SLURRY SOLUTION).

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

Melt/Freeze Pt: M.P/F.P Text: 3700F, 2038C
Spec Gravity: 3.2
pH: SUPDAT
Solubility in Water: INSOLUBLE
Appearance and Odor: OFF-WHITE CRYSTALLINE OR GELATINOUS GRANULES,
PELLETS OR POWDER; NO ODOR.

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

Stability Indicator/Materials to Avoid: YES
CONTACT W/WATER GENERATES HEAT.
Stability Condition to Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products: NONE SPECIFIED BY MANUFACTURER.

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

Waste Disposal Methods: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL
REGULATIONS . WASTE MAY BE CONSIDERED AS INERT MATERIAL, SUITABLE
FOR LANDFILL. RCRA HAZARDOUS WASTE NO: NOT FEDERALLY REGULATED.

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particular situation.

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ALKALINE POTASSIUM IODIDE AZIDE (CODE #7166) -- 6810-01-271-4046

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

Product ID:ALKALINE POTASSIUM IODIDE AZIDE (CODE #7166)

MSDS Date:04/23/1999

FSC:6810

NIIN:01-271-4046

Status Code:A

MSDS Number: CKGQG

=== Responsible Party ===

Company Name:LAMOTTE COMPANY

Box:329

City:CHESTERTOWN

State:MD

ZIP:21620

Country:US

Info Phone Num:410-778-3100

Emergency Phone Num:410-778-3100

Chemtrec Ind/Phone:(800)424-9300

CAGE:34807

=== Contractor Identification ===

Company Name:KAMPI COMPONENTS CO., INC.

Address:210 RT 13

Box:721

City:BRISTOL

State:PA

ZIP:19007-3517

Country:US

Phone:215-736-2000

Contract Num:SP0450-00-M-D703

CAGE:7Z016

Company Name:LAMOTTE COMPANY

Address:802 WASHINGTON AVE.

Box:329

City:CHESTERTOWN

State:MD

ZIP:21620

Country:US

Phone:410-778-3100

CAGE:34807

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

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Ingred Name: **POTASSIUM HYDROXIDE** (SARA III)
CAS:1310-58-3
RTECS #:TT2100000
Minumum % Wt:60.
Maxumum % Wt:70.
Other REC Limits:NONE RECOMMENDED
OSHA PEL:C, 2 MG/M3
ACGIH TLV:C 2 MG/M3; 9293
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name: **SODIUM AZIDE** (SARA III)
CAS:26628-22-8
RTECS #:VY8050000
< Wt:1.
Other REC Limits:NONE RECOMMENDED
OSHA PEL:S, C 0.1 PPM(HN3)
ACGIH TLV:C 0.11 PPM; 9293
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name: **POTASSIUM IODIDE**
CAS:7681-11-0
RTECS #:TT2975000
= Wt:14.
Other REC Limits:NONE RECOMMENDED

Ingred Name: **WATER**
CAS:7732-18-5
RTECS #:ZC0110000
Fraction by Wt: TO 100%

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

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:NO Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:TARGET ORGANS: CORROSIVE TO ALL BODY PARTS, EYES, SKIN.
Effects of Overexposure:SEVERE BURNS, MAY BE FATAL IF SWALLOWED.

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

First Aid:EYE CONTACT: IMMEDIATELY FLUSH WITH WATER FOR 15 MINUTES. CONSULT PHYSICIAN. SKIN CONTACT: IMMEDIATELY FLUSH WITH WATER, REMOVE AFFECTED CLOTHING AND FLUSH SKIN FOR 15 MINUTES. INGESTION: DO NOT INDUC E VOMITING. RINSE MOUTH, DRINK GLASS OF WATER AND CONSULT PHYSICIAN. INHALATION: REMOVE TO FRESH AIR.

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

Extinguishing Media:NOT A FIRE HAZARD.
Fire Fighting Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT INHALATION AND CONTACT WITH EYES.
Unusual Fire/Explosion Hazard:VIOLENT EXOTHERMIC REACTION OCCURS WITH WATER. MAY PRODUCE ENOUGH HEAT TO IGNITE COMBUSTIBLES. CAN REACT WITH METALS TO PRODUCE HYDROGEN, FORMING EXPLOSIVE MIX WITH AIR.

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

Spill Release Procedures:NEUTRALIZE BY CAREFULLY AND SLOWLY ADDING DILUTE HYDROCHLORIC ACID (CONC, 6M, OR LESS) TO PH 7. COLLECT WASTE LIQUID.

Neutralizing Agent:HYDROCHLORIC ACID

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

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE ITEMS (ACIDS, METALS).

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

Respiratory Protection:NONE SPECIFIED BY MANUFACTURER.

Ventilation:NORMAL VENTILATION

Protective Gloves:YES

Eye Protection:YES

Other Protective Equipment:LAB COAT

Work Hygienic Practices:AVOID CONTACT WITH SKIN AND CLOTHING.

Supplemental Safety and Health

NONE

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

HCC:B1

pH:14

Solubility in Water:SOLUBLE

Appearance and Odor:CLEAR, COLORLESS LIQUID - NO ODOR

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

Stability Indicator/Materials to Avoid:YES

STRONG ACIDS, METALS

Stability Condition to Avoid:HEAT

Hazardous Decomposition Products:HYDROGEN GAS

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

Toxicological Information:ORAL RAT LD50: 365 MG/KG FOR POTASSIUM HYDROXIDE; 27 MG/KG FOR SODIUM AZIDE SOLID.

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

Waste Disposal Methods:SMALL AMT. <25 ML- FLUSH NEUTRALIZED WASTE TO DRAIN WITH WATER. LARGE AMT.- SODIUM AZIDE CAN REACT WITH METAL, SUCH AS COPPER PIPES, TO FORM SHOCK OR FRICTION SENSITIVE METAL AZIDES (EXPLOSIVE). DISP OSE OF LARGER AMTS AS HAZARDOUS WASTE, ACCORDING TO FEDERAL, STATE AND LOCAL REGULATIONS.

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Material Safety Data Sheet

Aluminum ammonium sulfate dodecahydrate, reagent (crystals), 99% (titr.)
ACC# 00104

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum ammonium sulfate dodecahydrate, reagent (crystals), 99% (titr.)

Catalog Numbers: AC400540000, AC400545000

Synonyms: Ammonium aluminum dodecahydrate

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

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

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7784-26-1	Aluminum ammonium sulfate dodecahydrate, reagent	>97	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Not available.

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

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: Causes 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: Prolonged or repeated skin contact may cause irritation.

Section 4 - First Aid Measures

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

Extinguishing Media: Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: N/A

Upper: N/A

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

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

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

Section 8 - Exposure Controls, Personal Protection

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum ammonium sulfate dodehydrate, reagent	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum ammonium sulfate dodehydrate, reagent: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: Not available.

Odor: Odorless.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 200 deg C

Freezing/Melting Point: 94.5 deg C

Decomposition Temperature: > 280 deg C

Solubility: Not available.

Specific Gravity/Density: 1.6500g/cm³

Molecular Formula: H₄AlNO₈S₂·12H₂O

Molecular Weight: 453.33

Section 10 - Stability and Reactivity

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Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong bases, aluminum, copper, steel, zinc.

Hazardous Decomposition Products: Nitrogen oxides, 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# 7784-26-1: WS5640010

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7784-26-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-26-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7784-26-1: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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# 7784-26-1 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

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

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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# 7784-26-1: 1

Canada - DSL/NDSL

CAS# 7784-26-1 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

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

Canadian Ingredient Disclosure List

CAS# 7784-26-1 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List

Material Safety Data Sheet

Aluminum Oxide, 99%

ACC# 95871

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum Oxide, 99%

Catalog Numbers: AC215700000, AC215700010, AC215700250, AC215702500

Synonyms: Aluminum Oxide; Morin Dyed; Alumina.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

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

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1344-28-1	Aluminum oxide	99	215-691-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause mechanical eye and skin irritation. May cause respiratory tract irritation. May cause lung damage.

Target Organs: Lungs.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Low hazard for usual industrial handling.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. May cause lung damage.

Chronic: Chronic inhalation of fine dusts may cause lung damage.

Section 4 - First Aid Measures

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Do not ingest or inhale.

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

Section 8 - Exposure Controls, Personal Protection

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Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum oxide	10 mg/m ³ TWA (particulate matter containing no asbestos and <1% crystalline silica)	none listed	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Aluminum oxide: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

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

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Odorless.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 2980 deg C

Freezing/Melting Point: 2000 deg C

Decomposition Temperature: Not available.

Solubility: Negligible in water.

Specific Gravity/Density: 4.0 (water=1)

Molecular Formula: Al₂O₃

Molecular Weight: 101.9612

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials.

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Incompatibilities with Other Materials: Reacts with chlorine trifluoride or ethylene oxide. Exothermic reaction above 200C with halocarbon vapors produces toxic hydrogen chloride and phosgene.

Hazardous Decomposition Products: Hydrogen chloride, phosgene, none.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1344-28-1: BD1200000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1344-28-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.

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Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1344-28-1 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

This material contains Aluminum oxide (CAS# 1344-28-1, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

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

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

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

OSHA:

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

STATE

CAS# 1344-28-1 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Material Safety Data Sheets, Carver Hall RM 208-A

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1344-28-1: 0

Canada - DSL/NDSL

CAS# 1344-28-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

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

Canadian Ingredient Disclosure List

CAS# 1344-28-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Aluminum potassium sulfate dodecahydrate, reagent ACS, crystals

ACC# 01239

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum potassium sulfate dodecahydrate, reagent ACS, crystals

Catalog Numbers: AC423260000, AC423260010, AC423260030, AC423260050, AC423265000

Synonyms: Alum; Aluminum potassium sulfate, dodecahydrate; Kalinite; Potassium alum; Sulfuric acid, aluminum 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
7784-24-9	Aluminum potassium sulfate dodecahydrate	>98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause severe eye irritation and possible injury. May cause respiratory and digestive tract irritation. Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Target Organs: None.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: Dust is irritating to the respiratory tract.

Chronic: No information found.

Section 4 - First Aid Measures

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

Skin: 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 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. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

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

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

Spills/Leaks: 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. Wash clothing before reuse. Discard contaminated shoes.

Storage: Store in a cool, dry place. Keep containers tightly closed. Keep away from strong bases.

Section 8 - Exposure Controls, Personal Protection

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum potassium sulfate dodecahydrate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed
Potassium aluminum sulfate, anhydrous	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum potassium sulfate dodecahydrate: No OSHA Vacated PELs are listed for this chemical. Potassium aluminum 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

Odor: odorless

pH: 3.3 (0.2M solution)

Vapor Pressure: Not applicable.

Vapor Density: 16.4

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: 92.5 deg C

Decomposition Temperature: 200 deg C

Solubility: Partially soluble.

Specific Gravity/Density: 1.757

Molecular Formula: AlK(SO₄)₂.12H₂O

Molecular Weight: 474.3558

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, steel, aluminum, copper, zinc.

Hazardous Decomposition Products: Oxides of sulfur, aluminum oxide, oxides of potassium.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7784-24-9: WS5690000

CAS# 10043-67-1: WS5650000

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 7784-24-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 10043-67-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information 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

Material Safety Data Sheets, Carver Hall RM 208-A

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-24-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10043-67-1 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7784-24-9: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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# 7784-24-9 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

CAS# 10043-67-1 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

Material Safety Data Sheets, Carver Hall RM 208-A

California Prop 65

California No 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# 7784-24-9: No information available.

CAS# 10043-67-1: 1

Canada - DSL/NDSL

CAS# 10043-67-1 is listed on Canada's DSL List.

Canada - WHMIS

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# 7784-24-9 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

CAS# 10043-67-1 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Aluminum sulfate

ACC# 00980

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum sulfate

Catalog Numbers: AC192430000, AC192430050

Synonyms: Aluminum trisulfate; Dialuminum sulphate; Sulfuric acid aluminum salt

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

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

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-01-3	Aluminum sulfate	99	233-135-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

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

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Material Safety Data Sheets, Carver Hall RM 208-A

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

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

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

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

Section 8 - Exposure Controls, Personal Protection

Material Safety Data Sheets, Carver Hall RM 208-A

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum sulfate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: >2.9 at 5% solution.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 770 deg C

Decomposition Temperature: 770 deg C

Solubility: Soluble.

Specific Gravity/Density: 2.7 (water=1)

Molecular Formula: Al₂(SO₄)₃

Molecular Weight: 342.1358

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Hygroscopic: absorbs moisture or water from the air.

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

Incompatibilities with Other Materials: No significant incompatibilities identified with common

Material Safety Data Sheets, Carver Hall RM 208-A

materials and contaminants..

Hazardous Decomposition Products: Oxides of sulfur, aluminum oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10043-01-3: BD1700000

LD50/LC50:

CAS# 10043-01-3:

Draize test, rabbit, eye: 10 mg/24H Severe;

Oral, mouse: LD50 = 6207 mg/kg;

Carcinogenicity:

CAS# 10043-01-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

Material Safety Data Sheets, Carver Hall RM 208-A

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-01-3 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

CAS# 10043-01-3: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10043-01-3: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10043-01-3 is listed as a Hazardous Substance under the CWA.

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

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

OSHA:

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

STATE

CAS# 10043-01-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Aluminum, soluble salts), Massachusetts.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Material Safety Data Sheets, Carver Hall RM 208-A

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 10043-01-3: 1

Canada - DSL/NDSL

CAS# 10043-01-3 is listed on Canada's DSL List.

Canada - WHMIS

not available.

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

Canadian Ingredient Disclosure List

CAS# 10043-01-3 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- AMMONIUM BIFLUORIDE -- 6810-00N001396

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

Product ID:AMMONIUM BIFLUORIDE

MSDS Date:09/29/1994

FSC:6810

NIIN:00N001396

MSDS Number: CDWCV

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:1 REAGENT LANE

City:FAIR LAWN

State:NJ

ZIP:07410

Country:US

Info Phone Num:201-798-7100

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:ING 10: PELVIS & SPINAL COLUMN MAY OCCUR. FOR MORE INFO
CONCERNING HLTH HAZARDS CONTACT NEHC .

RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: TREAT SYMPTOMATICALLY & SUPPORTIVELY. GET
MED ATTN. EYE: WASH IMMEDIATELY W/LARGE AMTS OF WATER, OCCAS (ING 13)

RTECS #:9999999ZZ

Ingred Name:ING 12: LIFTING UPPER & LOWER LIDS, UNTIL NO EVIDENCE OF
CHEM REMAINS (APPROX 15-20 MIN). CONTINUE IRRIGATING (ING 14)

RTECS #:9999999ZZ

Ingred Name:ING 13: W/NORM SALINE UNTIL PH HAS REDUCED TO NORM (30-60
MIN). COVER W/STERILE BANDAGES. GET MED ATTN IMMEDIATELY. (ING 15)

RTECS #:9999999ZZ

Ingred Name:ING 14: INGEST: GIVE LARGE AMTS OF MILK/WATER IMMEDIATELY. DO NOT
GIVE ANYTHING BY MOUTH IF PERSON IS UNCONSCIOUS/OTHERWISE (ING 16)

RTECS #:9999999ZZ

Ingred Name:ING 15: UNABLE TO SWALLOW. DO NOT PERFORM GASTRIC
LAVAGE/INDUCE EMESIS. IF VOMIT OCCURS, KEEP HEAD LOWER THAN (ING
17)

RTECS #:9999999ZZ

Ingred Name:ING 16: HIPS TO HELP PREVENT ASPIRATION. TREAT SYMPTOMATICALLY &
SUPPORTIVELY. GET MED ATTN IMMEDIATELY. ANTIDOTE: POISONING (ING 18)

RTECS #:9999999ZZ

Material Safety Data Sheets, Carver Hall RM 208-A

Ingred Name:ING 17: FROM SOL FLUORIDE SALTS: GIVE CALCIUM GLUCONATE, 10
ML OF 10% SOLN INTRAVENOUSLY SLOWLY; REPEAT UNTIL (ING 19)
RTECS #:9999999ZZ

Ingred Name:ING 18: SYMPS DISAPPEAR. IF SERUM MAGNESIUM IS REDUCED,
GIVE MILK OF MAGNESIA, 10 ML EVERY HR. ANTIDOTE SHOULD (ING 20)
RTECS #:9999999ZZ

Ingred Name:ING 19: BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

Ingred Name:SPILL PROC: ISOLATE HAZARD AREA AND DENY ENTRY. REPORTABLE
QUANTITY (RQ): 100 POUNDS.
RTECS #:9999999ZZ

Ingred Name:AMMONIUM BIFLUORIDE (CERCLA)
CAS:1341-49-7
RTECS #:BQ9200000
Fraction by Wt: 100%
OSHA PEL:2.5 MG (F)/M3
ACGIH TLV:2.5 MG (F)/M3
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS

Ingred Name:EFTS OF OVEREXP: DISORDERS, INCL HYPOCALCEMIA,
HYPOMAGNESENIA, ACIDOSIS, & HYPERKALEMIA. PATHOLOGIC FINDINGS MAY
(ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2: INCL CONGESTION & HEMORRHAGIC INFILTRATION OF ALL
ORGANS & DEGENERATION OF KIDNEYS & LIVER. IN NON-FATAL (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3: CASES, MALAISE & EPIGASTRIC PAIN MAY PERSIST FOR
SEVERAL DAYS. MAY CAUSE IMMED PAIN & SEV BURNS OF MUC (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4: MEMB. THERE MAY BE DISCOLORATION OF TISS. EFTS ON
ESOPHAGUS & GI TRACT MAY RANGE FROM IRRIT TO SEV CORR. (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5: EDEMA OF EPIGLOTTIS & SHOCK MAY OCCUR. CHRONIC:
INHAL: RPTD/PRLNG EXPOS MAY CAUSE NOSEBLEEDS, HOARSENESS, (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6: SORE THROAT, SINUS TROUBLE, ASTHMA, INFLAMM &
ULCERATIVE CHANGES IN MOUTH & POSS BRONCH & GI DISTURBANCES. (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7: SKIN: RPTD/PRLNG EXPOS TO DUSTS, FUMES/CORR
SUBSTANCES MAY CAUSE DERM. EYE: RPTD & PRLNG EXPOS MAY CAUSE (ING
9)
RTECS #:9999999ZZ

Ingred Name:ING 8: CONJ. INGEST: MAY CAUSE FLUOROSIS CHARACTERIZED BY
NAUS, VOMIT, ANOREXIA, DIARR/CONSTIP, WT LOSS, ANEMIA, (ING 10)
RTECS #:9999999ZZ

Material Safety Data Sheets, Carver Hall RM 208-A

Ingred Name:ING 9: WEAK & GEN ILL HLTH. EXCESS CALCIFICATION OF BONES
W/BRITTLENESS & CALCIFICATION OF LIGAMENTS OF RIBS, (ING 11)
RTECS #:9999999ZZ

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

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: IN PRESENCE OF MOISTURE A CORR
SUBSTANCE MAY BE FORMED. INHAL: DUST MAY CAUSE IRRIT W/COUGHING &
SHORTNESS OF BRTH, NAUS, & LARYNGEAL & PULM EDEMA. MAY
CAUSE/AGGRAVATE ASTHMA. SYSTEMIC POISONING AS DETAILED IN ACUTE
INGEST MAY OCCUR. MAY CAUSE SEV IRRIT OF RESP TRACT W/COUGHING,
CHOKING, PAIN (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:HLTH HAZ: & POSS BURNS OF MUC MEMB. SEV CASES
MAY BE FATAL. SKIN: MAY CAUSE IRRIT W/REDNESS, PAIN & POSS BURNS.
ABSORPTION MAY OCCUR THRU DAMAGED SKIN & RSLT IN SYSTEMIC
POISONING. EYE: DUSTS/SOLNS MAY CAUSE IRRIT & POSS BURNS. INGEST:
SYMP OF ACUTE FLUORIDE TOXICITY MAY BE CAUSED BY A VARIETY OF
METABOLIC (ING 2)
Medical Cond Aggravated by Exposure:PERSONS WITH ASTHMA.

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

First Aid:INHAL: REMOVE TO FRESH AIR IMMED. PERFORM ARTF RESP IF NEC.
MAINTAIN AIRWAY, BLOOD PRESS & RESP. KEEP WARM & AT REST. TREAT
SYMPTOMATICALLY & SUPPORTIVELY. GET MED ATTN IMMED. SKIN: REMOVE
CONTAM CLTH G & SHOES IMMED. WASH W/SOAP & WATER UNTIL NO EVIDENCE
OF CHEM REMAINS (APPROX 15-20 MIN). IF BURNS OCCUR, COVER AFFECTED
AREA SECURELY W/STERILE, DRY, LOOSE-FITTING DRESSING. (ING 12)

===== 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:WEAR NIOSH APPRVD SCBA & FULL PROT EQUIP .
MOVE CONTR FROM FIRE AREA IF W/OUT RISK. APPLY COOLING WATER TO
SIDES OF CONTRS EXPOSED TO FLAMES (SUP DAT)
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO
HEAT OR FLAME.

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

Spill Release Procedures:DO NOT TOUCH MATL. STOP LEAK IF W/OUT RISK.
SML SPILL: TAKE UP W/ABSORB MATL & PLACE INTO CONTRS FOR LATER
DISP. SML DRY SPILL: W/CLEAN SHOVEL PLACE MATL INTO CLEAN, DRY
CONTR & COVER. LGE SPILL: DIKE FAR AHEAD OF SPILL FOR LATER DISP.
(ING 21)
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:OBSERVE ALL FED, STATE & LOC REGS WHEN
STORING SUBSTANCE. STORE IN PLASTIC, RUB, WOOL/PARAFFINED CONTRS.

Material Safety Data Sheets, Carver Hall RM 208-A

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

Other Precautions:DO NOT STORE IN GLASS/PORCELAIN CONTRS. STORE IN COOL, DRY PLACE; KEEP CONTR TIGHTLY CLSD WHEN NOT IN USE. MAY BURN BUT DOES NOT IGNITE READILY. FLAMM, POISONOUS GASES MAY ACCUM IN TANKS & HOPPER CARS . MAY IGNITE COMBUST (WOOD, PAPER, OIL).

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

Respiratory Protection:THE SPECIFIC RESP SELECTED MUST BE BASED ON CONTAM LEVELS FOUND IN WORK PLACE, MUST NOT EXCEED WORKING LIMS OF RESP & BE NIOSH APPRVD. FOR COMPLETE LIST OF RESPIRATORS 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 EMER EYEWASH & DELUGE SHOWER . APPROP PROT CLTHG & EQUIP TO PVNT CONT W/SUBSTANCE.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

FIRE FIGHT PROC: UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM ENDS OF TANKS. DO NOT USE WATER DIRECTLY ON MATL. IF LGE AMTS OF COMBUST MATLS INVOLVED, USE WATER SPRAY/FOG IN FLOODING AMTS TO ABSORB CO RR VAPS. COOL CONTRS FROM AS FAR AS DIST AS POSS. KEEP UPWIND.

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

Boiling Pt:B.P. Text:463F,239C

Melt/Freeze Pt:M.P/F.P Text:>257F,>125C

Vapor Pres:NEGLIGIBLE

Spec Gravity:1.211-1.51

Solubility in Water:38-58%

Appearance and Odor:ODORLESS, WHITE, RHOMBIC OR TETRAGONAL, DELIQUESCENT CRYSTALS OR FLAKES

Percent Volatiles by Volume:0

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

Stability Indicator/Materials to Avoid:YES

STRONG ACIDS, STRONG BASES, CEMENT, GLASS, METALS, SILICEOUS MATERIALS.

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:MAY INCLUDE TOXIC AND CORROSIVE AMMONIA, HYDROGEN FLUORIDE, AND TOXIC OXIDES OF NITROGEN.

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

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN DISPOSING OF THIS SUBSTANCE.

Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

Material Safety Data Sheet

Aluminum potassium sulfate dodecahydrate, reagent ACS, crystals

ACC# 01239

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum potassium sulfate dodecahydrate, reagent ACS, crystals

Catalog Numbers: AC423260000, AC423260010, AC423260030, AC423260050, AC423265000

Synonyms: Alum; Aluminum potassium sulfate, dodecahydrate; Kalinite; Potassium alum; Sulfuric acid, aluminum 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
7784-24-9	Aluminum potassium sulfate dodecahydrate	>98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Caution! May cause severe eye irritation and possible injury. May cause respiratory and digestive tract irritation. Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Target Organs: None.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: Dust is irritating to the respiratory tract.

Chronic: No information found.

Section 4 - First Aid Measures

Material Safety Data Sheets, Carver Hall RM 208-A

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

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

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid 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. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

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

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

Spills/Leaks: 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. Wash clothing before reuse. Discard contaminated shoes.

Storage: Store in a cool, dry place. Keep containers tightly closed. Keep away from strong bases.

Section 8 - Exposure Controls, Personal Protection

Material Safety Data Sheets, Carver Hall RM 208-A

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum potassium sulfate dodecahydrate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed
Potassium aluminum sulfate, anhydrous	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum potassium sulfate dodecahydrate: No OSHA Vacated PELs are listed for this chemical. Potassium aluminum 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

Odor: odorless

pH: 3.3 (0.2M solution)

Vapor Pressure: Not applicable.

Vapor Density: 16.4

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: 92.5 deg C

Decomposition Temperature: 200 deg C

Solubility: Partially soluble.

Specific Gravity/Density: 1.757

Molecular Formula: AlK(SO₄)₂·12H₂O

Molecular Weight: 474.3558

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, steel, aluminum, copper, zinc.

Hazardous Decomposition Products: Oxides of sulfur, aluminum oxide, oxides of potassium.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7784-24-9: WS5690000

CAS# 10043-67-1: WS5650000

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 7784-24-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 10043-67-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information 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

Material Safety Data Sheets, Carver Hall RM 208-A

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7784-24-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10043-67-1 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7784-24-9: delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

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

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

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

OSHA:

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

STATE

CAS# 7784-24-9 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

CAS# 10043-67-1 can be found on the following state right to know lists: California, (listed as Aluminum, soluble salts), Pennsylvania, (listed as Aluminum, soluble salts), Minnesota, (listed as Aluminum, soluble salts).

California Prop 65

Material Safety Data Sheets, Carver Hall RM 208-A

California No 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# 7784-24-9: No information available.

CAS# 10043-67-1: 1

Canada - DSL/NDSL

CAS# 10043-67-1 is listed on Canada's DSL List.

Canada - WHMIS

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# 7784-24-9 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

CAS# 10043-67-1 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet Aluminum sulfate

ACC# 00980

Section 1 - Chemical Product and Company Identification

MSDS Name: Aluminum sulfate

Catalog Numbers: AC192430000, AC192430050

Synonyms: Aluminum trisulfate; Dialuminum sulphate; Sulfuric acid aluminum salt

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

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

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

Section 2 - Composition, Information on Ingredients

Material Safety Data Sheets, Carver Hall RM 208-A

CAS#	Chemical Name	Percent	EINECS/ELINCS
10043-01-3	Aluminum sulfate	99	233-135-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

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

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. Expected to be a low ingestion hazard.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

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

Flash Point: Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

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

Section 8 - Exposure Controls, Personal Protection

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Aluminum sulfate	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	2 mg/m ³ TWA (as Al) (listed under Aluminum, soluble salts).	none listed

OSHA Vacated PELs: Aluminum sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: none reported
pH: >2.9 at 5% solution.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 770 deg C
Decomposition Temperature: 770 deg C
Solubility: Soluble.
Specific Gravity/Density: 2.7 (water=1)
Molecular Formula: Al₂(SO₄)₃
Molecular Weight: 342.1358

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Dust generation, exposure to moist air or water.
Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants.
Hazardous Decomposition Products: Oxides of sulfur, aluminum oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 10043-01-3: BD1700000
LD50/LC50:
CAS# 10043-01-3:
Draize test, rabbit, eye: 10 mg/24H Severe;
Oral, mouse: LD50 = 6207 mg/kg;

Carcinogenicity:
CAS# 10043-01-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Material Safety Data Sheets, Carver Hall RM 208-A

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

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10043-01-3 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Material Safety Data Sheets, Carver Hall RM 208-A

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

CAS# 10043-01-3: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10043-01-3: immediate, delayed.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 10043-01-3 is listed as a Hazardous Substance under the CWA.

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

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

OSHA:

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

STATE

CAS# 10043-01-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Aluminum, soluble salts), Massachusetts.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 10043-01-3: 1

Canada - DSL/NDSL

CAS# 10043-01-3 is listed on Canada's DSL List.

Canada - WHMIS

not available.

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

Canadian Ingredient Disclosure List

CAS# 10043-01-3 (listed as Aluminum, soluble salts) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- AMMONIUM BIFLUORIDE -- 6810-00N001396

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

Product ID:AMMONIUM BIFLUORIDE

MSDS Date:09/29/1994

FSC:6810

NIIN:00N001396

MSDS Number: CDWCV

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:1 REAGENT LANE

City:FAIR LAWN

State:NJ

ZIP:07410

Country:US

Info Phone Num:201-798-7100

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:ING 10: PELVIS & SPINAL COLUMN MAY OCCUR. FOR MORE INFO
CONCERNING HLTH HAZARDS CONTACT NEHC .

RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: TREAT SYMPTOMATICALLY & SUPPORTIVELY. GET
MED ATTN. EYE: WASH IMMEDIATELY W/LARGE AMTS OF WATER, OCCAS (ING 13)

RTECS #:9999999ZZ

Ingred Name:ING 12: LIFTING UPPER & LOWER LIDS, UNTIL NO EVIDENCE OF
CHEM REMAINS (APPROX 15-20 MIN). CONTINUE IRRIGATING (ING 14)

RTECS #:9999999ZZ

Ingred Name:ING 13: W/NORM SALINE UNTIL PH HAS REDUCED TO NORM (30-60
MIN). COVER W/STERILE BANDAGES. GET MED ATTN IMMEDIATELY. (ING 15)

RTECS #:9999999ZZ

Ingred Name:ING 14: INGEST: GIVE LARGE AMTS OF MILK/WATER IMMEDIATELY. DO NOT
GIVE ANYTHING BY MOUTH IF PERSON IS UNCONSCIOUS/OTHERWISE (ING 16)

RTECS #:9999999ZZ

Ingred Name:ING 15: UNABLE TO SWALLOW. DO NOT PERFORM GASTRIC
LAVAGE/INDUCE EMESIS. IF VOMIT OCCURS, KEEP HEAD LOWER THAN (ING
17)

RTECS #:9999999ZZ

Ingred Name:ING 16: HIPS TO HELP PREVENT ASPIRATION. TREAT SYMPTOMATICALLY &
SUPPORTIVELY. GET MED ATTN IMMEDIATELY. ANTIDOTE: POISONING (ING 18)

RTECS #:9999999ZZ

Material Safety Data Sheets, Carver Hall RM 208-A

Ingrid Name:ING 17: FROM SOL FLUORIDE SALTS: GIVE CALCIUM GLUCONATE, 10
ML OF 10% SOLN INTRAVENOUSLY SLOWLY; REPEAT UNTIL (ING 19)
RTECS #:9999999ZZ

Ingrid Name:ING 18: SYMPS DISAPPEAR. IF SERUM MAGNESIUM IS REDUCED,
GIVE MILK OF MAGNESIA, 10 ML EVERY HR. ANTIDOTE SHOULD (ING 20)
RTECS #:9999999ZZ

Ingrid Name:ING 19: BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

Ingrid Name:SPILL PROC: ISOLATE HAZARD AREA AND DENY ENTRY. REPORTABLE
QUANTITY (RQ): 100 POUNDS.
RTECS #:9999999ZZ

Ingrid Name:AMMONIUM BIFLUORIDE (CERCLA)
CAS:1341-49-7
RTECS #:BQ9200000
Fraction by Wt: 100%
OSHA PEL:2.5 MG (F)/M3
ACGIH TLV:2.5 MG (F)/M3
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS

Ingrid Name:EFTS OF OVEREXP: DISORDERS, INCL HYPOCALCEMIA,
HYPOMAGNESENIA, ACIDOSIS, & HYPERKALEMIA. PATHOLOGIC FINDINGS MAY
(ING 3)
RTECS #:9999999ZZ

Ingrid Name:ING 2: INCL CONGESTION & HEMORRHAGIC INFILTRATION OF ALL
ORGANS & DEGENERATION OF KIDNEYS & LIVER. IN NON-FATAL (ING 4)
RTECS #:9999999ZZ

Ingrid Name:ING 3: CASES, MALAISE & EPIGASTRIC PAIN MAY PERSIST FOR
SEVERAL DAYS. MAY CAUSE IMMED PAIN & SEV BURNS OF MUC (ING 5)
RTECS #:9999999ZZ

Ingrid Name:ING 4: MEMB. THERE MAY BE DISCOLORATION OF TISS. EFTS ON
ESOPHAGUS & GI TRACT MAY RANGE FROM IRRIT TO SEV CORR. (ING 6)
RTECS #:9999999ZZ

Ingrid Name:ING 5: EDEMA OF EPIGLOTTIS & SHOCK MAY OCCUR. CHRONIC:
INHAL: RPTD/PRLNG EXPOS MAY CAUSE NOSEBLEEDS, HOARSENESS, (ING 7)
RTECS #:9999999ZZ

Ingrid Name:ING 6: SORE THROAT, SINUS TROUBLE, ASTHMA, INFLAMM &
ULCERATIVE CHANGES IN MOUTH & POSS BRONCH & GI DISTURBANCES. (ING 8)
RTECS #:9999999ZZ

Ingrid Name:ING 7: SKIN: RPTD/PRLNG EXPOS TO DUSTS, FUMES/CORR
SUBSTANCES MAY CAUSE DERM. EYE: RPTD & PRLNG EXPOS MAY CAUSE (ING
9)
RTECS #:9999999ZZ

Ingrid Name:ING 8: CONJ. INGEST: MAY CAUSE FLUOROSIS CHARACTERIZED BY
NAUS, VOMIT, ANOREXIA, DIARR/CONSTIP, WT LOSS, ANEMIA, (ING 10)
RTECS #:9999999ZZ

Material Safety Data Sheets, Carver Hall RM 208-A

Ingred Name:ING 9: WEAK & GEN ILL HLTH. EXCESS CALCIFICATION OF BONES
W/BRITTLNESS & CALCIFICATION OF LIGAMENTS OF RIBS, (ING 11)
RTECS #:9999999ZZ

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

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: IN PRESENCE OF MOISTURE A CORR
SUBSTANCE MAY BE FORMED. INHAL: DUST MAY CAUSE IRRIT W/COUGHING &
SHORTNESS OF BRTH, NAUS, & LARYNGEAL & PULM EDEMA. MAY
CAUSE/AGGRAVATE ASTHMA. SYSTEMIC POISONIN G AS DETAILED IN ACUTE
INGEST MAY OCCUR. MAY CAUSE SEV IRRIT OF RESP TRACT W/COUGHING,
CHOKING, PAIN (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:HLTH HAZ: & POSS BURNS OF MUC MEMB. SEV CASES
MAY BE FATAL. SKIN: MAY CAUSE IRRIT W/REDNESS, PAIN & POSS BURNS.
ABSORPTION MAY OCCUR THRU DAMAGED SKIN & RSLT IN SYSTEMIC
POISONING. EYE: DUSTS/SOLNS MA Y CAUSE IRRIT & POSS BURNS. INGEST:
SYMPS OF ACUTE FLUORIDE TOXICITY MAY BE CAUSED BY A VARIETY OF
METABOLIC (ING 2)
Medical Cond Aggravated by Exposure:PERSONS WITH ASTHMA.

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

First Aid:INHAL: REMOVE TO FRESH AIR IMMED. PERFORM ARTF RESP IF NEC.
MAINTAIN AIRWAY, BLOOD PRESS & RESP. KEEP WARM & AT REST. TREAT
SYMPTOMATICALLY & SUPPORTIVELY. GET MED ATTN IMMED. SKIN: REMOVE
CONTAM CLTH G & SHOES IMMED. WASH W/SOAP & WATER UNTIL NO EVIDENCE
OF CHEM REMAINS (APPROX 15-20 MIN). IF BURNS OCCUR, COVER AFFECTED
AREA SECURELY W/STERILE, DRY, LOOSE-FITTING DRESSING. (ING 12)

===== 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:WEAR NIOSH APPRVD SCBA & FULL PROT EQUIP .
MOVE CONTR FROM FIRE AREA IF W/OUT RISK. APPLY COOLING WATER TO
SIDES OF CONTRS EXPOSED TO FLAMES (SUP DAT)
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO
HEAT OR FLAME.

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

Spill Release Procedures:DO NOT TOUCH MATL. STOP LEAK IF W/OUT RISK.
SML SPILL: TAKE UP W/ABSORB MATL & PLACE INTO CONTRS FOR LATER
DISP. SML DRY SPILL: W/CLEAN SHOVEL PLACE MATL INTO CLEAN, DRY
CONTR & COVER. LGE SPILL: DIKE FAR AHEAD OF SPILL FOR LATER DISP.
(ING 21)
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:OBSERVE ALL FED, STATE & LOC REGS WHEN
STORING SUBSTANCE. STORE IN PLASTIC, RUB, WOOL/PARAFFINED CONTRS.

Material Safety Data Sheets, Carver Hall RM 208-A

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

Other Precautions:DO NOT STORE IN GLASS/PORCELAIN CONTRS. STORE IN COOL, DRY PLACE; KEEP CONTR TIGHTLY CLSD WHEN NOT IN USE. MAY BURN BUT DOES NOT IGNITE READILY. FLAMM, POISONOUS GASES MAY ACCUM IN TANKS & HOPPER CARS . MAY IGNITE COMBUST (WOOD, PAPER, OIL).

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

Respiratory Protection:THE SPECIFIC RESP SELECTED MUST BE BASED ON CONTAM LEVELS FOUND IN WORK PLACE, MUST NOT EXCEED WORKING LIMS OF RESP & BE NIOSH APPRVD. FOR COMPLETE LIST OF RESPIRATORS 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 EMER EYEWASH & DELUGE SHOWER . APPROP PROT CLTHG & EQUIP TO PVNT CONT W/SUBSTANCE.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

FIRE FIGHT PROC: UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM ENDS OF TANKS. DO NOT USE WATER DIRECTLY ON MATL. IF LGE AMTS OF COMBUST MATLS INVOLVED, USE WATER SPRAY/FOG IN FLOODING AMTS TO ABSORB CO RR VAPS. COOL CONTRS FROM AS FAR AS DIST AS POSS. KEEP UPWIND.

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

Boiling Pt:B.P. Text:463F,239C

Melt/Freeze Pt:M.P/F.P Text:>257F,>125C

Vapor Pres:NEGLIGIBLE

Spec Gravity:1.211-1.51

Solubility in Water:38-58%

Appearance and Odor:ODORLESS, WHITE, RHOMBIC OR TETRAGONAL, DELIQUESCENT CRYSTALS OR FLAKES

Percent Volatiles by Volume:0

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

Stability Indicator/Materials to Avoid:YES

STRONG ACIDS, STRONG BASES, CEMENT, GLASS, METALS, SILICEOUS MATERIALS.

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:MAY INCLUDE TOXIC AND CORROSIVE AMMONIA, HYDROGEN FLUORIDE, AND TOXIC OXIDES OF NITROGEN.

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

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN DISPOSING OF THIS SUBSTANCE.

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Material Safety Data Sheet

Ammonium Bromide

ACC# 01140

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Bromide

Catalog Numbers: A650-500, S79895

Synonyms: Hydrobromic Acid Monoammoniate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12124-97-9	Ammonium Bromide	100	235-183-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye irritation. May cause respiratory and digestive tract irritation. May cause skin irritation. Air sensitive. Hygroscopic (absorbs moisture from the air).

Target Organs: No data found.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation.

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

Inhalation: May cause respiratory tract irritation. Inhalation of bromides may cause irritation of the upper respiratory tract and lung tissue.

Chronic: Chronic ingestion may cause bromism characterized by disturbances of the central nervous system, skin and digestive tract.

Section 4 - First Aid Measures

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

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

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation. Handle under an inert atmosphere. Store protected from air.

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

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incompatible substances. Do not expose to air. Store protected from moisture. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium Bromide	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium Bromide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Slightly acidic.

Vapor Pressure: 1 mm Hg @ 198C

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:846 deg F

Decomposition Temperature:Not available.

Solubility: 97% in water.

Specific Gravity/Density:2.4

Molecular Formula:NH₄Br

Molecular Weight:97.9387

Section 10 - Stability and Reactivity

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Chemical Stability: Stable.

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

Incompatibilities with Other Materials: Air, moisture, strong oxidizing agents.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, hydrogen bromide, ammonia and/or derivatives.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 12124-97-9: B09155000

LD50/LC50:

CAS# 12124-97-9:

Oral, mouse: LD50 = 2860 mg/kg;

Oral, rat: LD50 = 2700 mg/kg;

Oral, rat: LD50 =

Carcinogenicity:

CAS# 12124-97-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12124-97-9 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 12124-97-9: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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# 12124-97-9 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

Material Safety Data Sheets, Carver Hall RM 208-A

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 12124-97-9: No information available.

Canada - DSL/NDSL

CAS# 12124-97-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

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

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Ammonium 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.

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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,

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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

Material Safety Data Sheets, Carver Hall RM 208-A

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,

Material Safety Data Sheets, Carver Hall RM 208-A

waste generators must consult state and local hazardous waste regulations to ensure 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 depleters.

This material does not contain any Class 2 Ozone depleters.

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.

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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.

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FISHER SCIENTIFIC, CHEMICAL DIV. -- AMMONIUM DICHROMATE, A644500 -- 6810-00N008683

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

Product ID:AMMONIUM DICHROMATE, A644500
MSDS Date:05/25/1986
FSC:6810
NIIN:00N008683
MSDS Number: BCQW
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410-2802
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100 (GASTON L. PILLORI)
CAGE:1B464

==== Contractor Identification ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

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

Ingred Name:AMMONIUM DICHROMATE (BICHROMATE) (SARA III)
CAS:7789-09-5
RTECS #:HX7650000
Fraction by Wt: 99.8%
Other REC Limits:N/K
OSHA PEL:0.1PPM CRO3;CEILING
ACGIH TLV:0.05 MG CR/M3
EPA Rpt Qty:10 LBS
DOT Rpt Qty:10 LBS

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

LD50 LC50 Mixture:N/K
Reports of Carcinogenicity:NTP:NO IARC:YES OSHA:NO
Health Hazards Acute and Chronic:INHAL:CHRONICALLY 0.11-0.15 MG/CUM
PRODUCES BLEEDING & PAINLESS ULCERATION OF THE NASAL SEPTUM W/
NASAL DISCHARGE & BRONCHITIS.POSS LIVER DAMAGE W/
JAUNDICE.SKIN:RASH, SENSIT DERMAT W/ ECZEMA, SLOW-HEAL ING PAINLESS
ULCERATION OF SKIN WHICH LEAVES DEPRESSED SCARS.EYES:PRLNG CONT OF
FINE SPRAY MAY CAUSE (SEE SUPP DATA)
Explanation of Carcinogenicity:CR & CERTAIN CR CMPS:SUFF EVIDENCE FOR
CARCIN IN HUMANS;SUFF EVIDENCE FOR CARCIN IN ANIMALS (IARC,1982).
Effects of Overexposure:THIS IS A CORROSIVE
SUBSTANCE/SOLUTION.INHAL:SEVERE IRRITATION OF NOSE, THROAT, &
RESPIRATORY TRACT.SKIN:REDNESS, PAIN & ULCERATION.EYES:IRRIT &
PAIN.INGEST:DIZZINESS, INTENSE THRIST, ABDOMINAL PAIN, VOMITI NG &
SHOCK.
Medical Cond Aggravated by Exposure:N/K

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

First Aid:INHAL:REMOVE TO FRESH AIR.IF NO BRTHING,PERFORM ARTF
RESP.KEEP PERSON WARM & CALM.GET MD ATTN.SKIN:REMOVE CONTAM
CLOTHING & SHOES.WASH AREA W/ MILD SOAP & H*2O UNTIL NO CHEM
REMAINS (15-20 MIN).GET MD ATTN.EYES:WASH W/ H*2O FOR AT LEAST
15MIN WHILE HOLDING LIDS OPEN.INGEST:IF CONSCIOUS,IMMED GIVE 2-4
GLASSES H*2O & INDUCE VOMITING.GET MD ATTN IMMED.

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

Flash Point:NONCOMBUSTIBLE
Extinguishing Media:DRY CHEMICAL OR CARBON DIOXIDE.FOR LARGE
FIRES,FLOOD AREA W/ WATER FROM A DISTANCE.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT .DO NOT GET SOLID STREAM OF H*2O ON SPILLED MATL.MOVE
CNTNRS FROM FIRE AREA IF POSS.(SEE SUP DAT)
Unusual Fire/Explosion Hazard:STRONG OXIDIZER.MAY REACT VIOLENTLY OR
EXPLODE IN CONTACT W/ COMBUSTIBLE OR REDUCING MATLS OR WHEN HEATED
ABOVE 225C.CR TRIOXIDE SMOKE & NITROGEN RELEASED.

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

Spill Release Procedures:LG:DIKE AHEAD FOR LATER DISPOSAL.DENY UNNEC
ENTRY.SMALL:TAKE UP W/ SAND OR OTHER ABSORB MATL OR IF DRY,SHOVEL
W/ CLEAN DRY SHOVEL INTO CLEAN DRY CNTNRS & COVER.DO NOT TOUCH
SPILLED MATL.KEEP COMBUSTIB LES (WOOD,PAPER,OIL,ETC) AWAY FROM
SPILLED MATL.
Neutralizing Agent:NA BISULFATE,AGRICULTURAL LIME,SLAKED LIME,CRUSHED
LIMESTONE,SODIUM BICARBONATE.

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

Handling and Storage Precautions:PROTECT CNTNRS FROM PHYSICAL
DAMAGE.KEEP DRY & SEPARATE FROM COMBUSTIBLE,ORGANIC OR OXIDIZABLE
MTLS.AVOID STORAGE ON WOOD FLOORS (NFPA 1982.FP N/ORNL)
Other Precautions:N/K

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

Respiratory Protection:5 MG/CUM:HIGH-EFFICIENT PARTICULATE
RESP,SUPPLY-AIR RESP/SCBA;ALL W/FULL FACEPIECE.30 MG/CUM:POWER
AIR-PURIFY RESP W/ORGANIC VAP CARTRIDGE,HIGH EFFICIENT PARTICULATE
FILTER W/FULL FACEPIECE.TYPE C SUP PLY-AIR RESP W/FULL
FACEPIECE(SUPP DATA)
Ventilation:PROCESS ENCLOSURE OR LOCAL EXHAUST VENTILATION TO KEEP
CONCENTRATION BELOW TLV.
Protective Gloves:APPROPRIATE PROTECTIVE GLOVES.
Eye Protection:CHEM WORKER GOGGLES & FACESHIELD .
Other Protective Equipment:EYE-WASH FOUNTAIN WITHIN THE IMMEDIATE WORK
AREA & DELUGE SHOWER PROTECTIVE CLOTHING TO AVOID ANY SKIN CONTACT.
Work Hygienic Practices:N/K
Supplemental Safety and Health
SPEC FIRE PROC:COOL CNTNRS W/H+2O FROM SIDE UNTIL FIRE OUT.FLOOD AREA
W/H*2O.AVOID BRTHG TOX VAP/DUST.HLTH HAZ:CONJUNCT,LACRIMATION, POSS
BROWN DISCOLOR.SPLASH CAUSES SEV,PERM CORNEAL INJURY.INGEST:OLI
GURIA,ANURIA,SEV CIRCULAT COLLAPSE,DEATH FROM UREMIA.RESP:IN PRESS
DEMAND MODE OR IN CONTINUOUS-FLOW MODE.

Material Safety Data Sheets, Carver Hall RM 208-A

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

Boiling Pt:B.P. Text:N/K
Melt/Freeze Pt:M.P/F.P Text:365F,180C
Decomp Temp:Decomp Text:256F,124.4C
Vapor Pres:N/K
Vapor Density:N/K
Spec Gravity:2.2 @ 25C,77F
pH:3.5
Evaporation Rate & Reference:N/K
Solubility in Water:30.8%
Appearance and Odor:ODORLESS,YELLOW TO ORANGE-RED CRYSTALS

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

COMBUSTIBLE & OXIDIZABLE MATLS (WOOD SHAVINGS,CARBIDE,HG
CYANIDE,HYDRAZINE & HYDRATES,HYDROXYL-AMINE & THE SALTS).
Stability Condition to Avoid:HEATING PAST 256F,124.4C.CONTACT W/ FUELS
(REACTION MAY BE VIOLENT).PROXIMITY TO OTHER COMBUST MTL.RUNOFF TO
SEWER.
Hazardous Decomposition Products:CHROMIC TRIOXIDE SMOKE & NITROGEN.

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

Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE WITH
FEDERAL,STATE AND LOCAL REGULATIONS .

Disclaimer (provided with this information by the compiling agencies):
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of Defense. The United States of America in no manner whatsoever,
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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

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

Material Safety Data Sheets, Carver Hall RM 208-A

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

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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

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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

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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 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# 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

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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

Material Safety Data Sheets, Carver Hall RM 208-A

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

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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: R02750000

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.

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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.

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Section 12b

None of the chemicals are listed under TSCA Section 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

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FISHER SCIENTIFIC CO. CHEMICAL MFG DIV -- AMMONIUM PHOSPHATE DIBASIC -- -

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

Product ID:AMMONIUM PHOSPHATE DIBASIC
MSDS Date:02/23/1999
FSC:NIIN:Submitter:D DG
Status Code:A
MSDS Number: CKWLV
==== Responsible Party ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
Resp. Party Other MSDS Num.:01350
Chemtrec Ind/Phone:(800)424-9300
CAGE:1B464

==== Contractor Identification ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

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

Ingred Name:DIAMMONIUM PHOSPHATE
CAS:7783-28-0
> Wt:99.

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

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYES: DUSTS MAY CAUSE PERSISTENT EYE
IRRITATION AND CONJUNCTIVITIS. SKIN: MAY CAUSE MILD SKIN
IRRITATION. INGESTION: CAUSES GASTROINTESTINAL IRRITATION WITH
NAUSEA, VOMITING AND DIARRHEA. INHALATION: MAY CAUSE RESPIRATORY
TRACT IRRITATION. CHRONIC: PROLONGED OR REPEATED SKIN CONTACT MAY
CAUSE DERMITITIS.
Explanation of Carcinogenicity:NOT LISTED BY ACGIH, IARC, NIOSH, NTP,
OR OSHA.
Effects of Overexposure:EYES: IRRITATION, CONJUNCTIVITIS. SKIN:
IRRITATION. INGESTION: GASTROINTESTINAL IRRITATION, NAUSEA,
VOMITING AND DIARRHEA. INHALATION: RESPIRATORY TRACT IRRITATION.
CHRONIC: SKIN: DERMITITIS.

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

First Aid:EYES: FLUSH WITH PLENTY OF WATER FOR 15 MINUTES, OCCASIONALLY
LIFTING EYELIDS. GET MEDICAL AID. SKIN: FLUSH WITH SOAP AND WATER
FOR 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. GET
MEDIC AL AID IF IRRIATTION DEVELOPS OR PERSISTS. WASH CLOTHING

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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: MOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL AID. NOTES TO PHYSICIAN : TREAT SYMPTOMATICALLY.

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

Flash Point:NONCOMBUSTIBLE

Extinguishing Media:SUBSTANCE IS NONCOMBUSTIBLE; USE AGENT MOST APPROPRIATE TO EXTINGUISH SURROUNDING FIRE. IN CASE OF FIRE USE WATER SPRAY, DRY CHEMICAL, CARBON DIOXIDE, OR APPROPRIATE FOAM.

Fire Fighting Procedures:AS IN ANY FIRE, WEAR A SELF-CONTAINED BREATHING APPARATUS IN PRESSURE-DEMAND, MSHA/NIOSH (APPROVED OR EQUIVALENT), AND FULL PROTECTIVE GEAR.

Unusual Fire/Explosion Hazard:DURING A FIRE, IRRITATING AND HIGHLY TOXIC GASES MAY BE GENERATED BY THERMAL DECOMPOSITION OR COMBUSTION.

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

Spill Release Procedures:USE PROPER PROTECTIVE EQUIPMENT. VACUUM OR SWEEP UP MATERIAL AND PLACE INTO A SUITABLE DISPOSAL CONTAINER. AVOID GENERATING DUSTY CONDITIONS. PROVIDE VENTILATION.

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

Handling and Storage Precautions:HANDLING: USE WITH ADEQUATE VENTILATION. AVOID CONTACT WITH SKIN AND EYES. KEEP CONTAINER TIGHTLY CLOSED. AVOID INGESTION AND INHALATION. STORAGE: STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE SUBSTANCES. KEEP CONTAINER TIGHTLY CLOSED.

Other Precautions:USE PROPER PERSONAL PROTECTIVE EQUIPMENT.

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

Respiratory Protection:FOLLOW THE OSHA RESPIRATOR REGULATIONS FOUND IN 29 CFR 1910.134 OR EUROPEAN STANDARD EN 149. ALWAYS USE A NIOSH OR EUROPEAN STANDARD EN 149 APPROVED RESPIRATOR WHEN NECESSARY.

Ventilation:USE ADEQUATE VENTILATION TO KEEP AIRBORNE CONCENTRATIONS LOW.

Protective Gloves:WEAR APPROPRIATE GLOVES TO PREVENT SKIN EXPOSURE.

Eye Protection:PROTECTIVE EYEGLASSES OR CHEMICAL SAFETY GOGGLES AND FACESHIELD AS NEEDED.

Other Protective Equipment:WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT SKIN EXPOSURE.

Work Hygienic Practices:USE WITH ADEQUATE VENTILATION. AVOID CONTACT WITH SKIN AND EYES. AVOID INGESTION AND INHALATION.

Supplemental Safety and Health

CATALOG NOS: A686 500, A686-3, A686-500, A6863, A686500, BP361 500, BP361-500, BP3611000, BP361500. SYNONYMS: DIAMMONIUM HYDROGEN PHOSPHATE, PHOSPHORIC ACID DIAMMONIUM SALT.

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

HCC:N1

Melt/Freeze Pt:=-155.C, 311.F

Material Safety Data Sheets, Carver Hall RM 208-A

Decomp Temp:=155.C, 311.F

Vapor Pres:NEGLIGIBLE

Vapor Density:NEGLIGIBLE

Spec Gravity:1.619

pH:8.0

Evaporation Rate & Reference:NEGLIGIBLE

Solubility in Water:58G/100ML (10C)

Appearance and Odor:SOLID, WHITE; AMMONIA-LIKE-WEAK ODOR.

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

Stability Indicator/Materials to Avoid:YES

SODIUM HYPOCHLORITE.

Stability Condition to Avoid:STABLE UNDER NORMAL TEMPERATURES AND PRESSURES. AVOID INCOMPATIBLE MATERIALS, EXPOSURE TO AIR, EXCESS HEAT.

Hazardous Decomposition Products:OXIDES OF PHOSPHOROUS, NITRIC OXIDE (NOX), AND AMMONIA (NH3) FUMES.

Conditions to Avoid Polymerization:HAS NOT BEEN REPORTED.

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

Toxicological Information:RETECS#: CAS# 7783-28-0 UNLISTED. LD50/LC50: NOT AVAILABLE. CARCINOGENICITY: DIAMMONIUM PHOSPHATE NOT LISTED BY ACGIH, IARC, NIOSH, NTP, OR OSHA. NO INFORMATION AVAILABLE ON FOLLOWING:TERATOGENICITY, REPRODUCTIVE EFFECTS, NEUROTOXICITY, MUTAGENICITY. OTHER STUDIES: NO DATA AVAILABLE.

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

Ecological:ECOTOXICITY: FATHEAD MINNOW LC50=155 PPM/ 96 HR.

ENVIRONMENTAL FATE: NOT AVAILABLE. PHYSICAL/CHEMICAL: NOT AVAILABLE. OTHER: NOT AVAILABLE. CLEAN AIR ACT: THIS MATERIAL DOES NOT CONTAIN ANY HAZARDOUS AIR POLLUTANTS, OR ANY CLASS 1 OZONE DEPLETORS, OR ANY CLASS 2 OZONE DEPLETORS. CLEAN WATER ACT: NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS HAZARDOUS SUBSTANCES UNDER THE CWA OR LISTED AS PRIORITY POLLUTANTS UNDER THE CWA, OR ARE LISTED AS TOXIC POLLUTANTS UNDER THE CWA..

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

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL, STATE AND LOCAL REGULATIONS. RCRA P-SERIES: NONE LISTED; RCRA U-SERIES: NONE LISTED.

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

Transport Information:US DOT: NO INFORMATION AVAILABLE. IMO: NOT REGULATED AS A HAZARDOUS MATERIAL. IATA: NO REGULATED AS A HAZARDOUS MATERIAL. RID/ADR: NOT REGULATED AS A HAZARDOUS MATERIAL. CANADIAN TDG: NO INFORMATION A VAILABLE.

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

SARA Title III Information:SECTION 302 (RQ): NONE OF THE CHEMICALS IN THIS MATERIAL HAVE AN RQ. SECTION 302 (TPQ): NONE OF THE CHEMICALS IN THIS PRODUCT HAVE A TPQ). SARA CODES: CAS# 7783-28-0: ACUTE. SECTION 313: NO CHEMICALS ARE REPORTABLE UNDER SECTION 313.

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Federal Regulatory Information:TSCA: CAS# 7783-28-0 IS LISTED ON THE TSCA INVENTORY. HEALTH & SAFETY REPORTING LIST: NONE OF THE CHEMICALS ARE ON THE HEALTH & SAFETY REPORTING LIST. CHEMICAL TEST RULES: NONE OF THE CHEMICALS IN THIS PRODUCT ARE UNDER A CHEMICAL TEST RULE. SECTION 12B: NONE OF THE CHEMICALS ARE LISTED UNDER TSCA SECTION 12B. TSCA SIGNIFICANT NEW USE RULE: NONE OF THE CHEMICALS IN THIS MATERIAL HAVE A SNUR UNDER TSCA. OSHA: NONE OF THE CHEMICALS IN THIS PRODUCT ARE CONSIDERED HIGHLY HAZARDOUS BY OSHA.

State Regulatory Information:DIAMMONIUM PHOSPHATE IS NOT PRESENT ON STATE LISTS FROM CA, PA, MN, MA, FL, OR NJ. CALIFORNIA NO SIGNIFICANT RISK LEVEL: NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED.

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

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-- AMMONIUM PURPURATE -- 6810-00F004340

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

Product ID:AMMONIUM PURPURATE

MSDS Date:01/01/1987

FSC:6810

NIIN:00F004340

MSDS Number: BBQCW

=== Responsible Party ===

Company Name:EM SCIENCE/CHERRY HILL, NJ 08034

Emergency Phone Num:(609) 354-9200

CAGE:EO864

=== Contractor Identification ===

Company Name:E M SCIENCE DIV OF E M INDUSTRIES INC

Address:480 DEMOCRAT ROAD

Box:70

City:GIBBSTOWN

State:NJ

ZIP:08027

Country:US

Phone:800-222-0342/609-423-6300

CAGE:63612

Company Name:EM SCIENCE/CHERRY HILL, NJ 08034

CAGE:EO864

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

Ingred Name:AMMONIUM PURPURATE

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

Effects of Overexposure:GET MEDICAL ASSISTANCE FOR ALL CASES OF
OVEREXPOSURE.

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

First Aid:SKIN CONTACT: WASH WITH SOAP & WATER. EYE CONTACT: FLUSH
THOROUGHLY WITH WATER. INHALATION: REMOVE TO FRESH AIR.

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

Extinguishing Media:WATER SPRAY, FOAM, CO2

Fire Fighting Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS.

Unusual Fire/Explosion Hazard:NONE

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

Spill Release Procedures:TAKE UP AND CONTAINERIZE FOR PROPER DISPOSAL.

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

Handling and Storage Precautions:DO NOT BREATHE DUST. AVOID CONTACT
WITH SKIN AND EYES. DO NOT TAKE INTERNALLY. WASH THOROUGHLYFTER
HANDLING.

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

Respiratory Protection:DUST RESPIRATOR REQUIRED IF CONDITIONS WARRANT.

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Ventilation:PROVIDE LOCAL EXHAUST/MECH VENTILATION TO KEEP BELOW TLV
Protective Gloves:PROTECTIVE
Eye Protection:SAFETY GOGGLES
Other Protective Equipment:PROTECTIVE CLOTHING
Supplemental Safety and Health
MSDS DATE: JUL 84.

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

Boiling Pt:B.P. Text:760C
Solubility in Water:VERY SLIGHT
Appearance and Odor:RED POWDER

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

Stability Indicator/Materials to Avoid:YES
OXIDIZERS
Hazardous Decomposition Products:COX, NITROGEN COMPOUNDS

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

Waste Disposal Methods:TO BE PERFORMED IN COMPLIANCE WITH ALL CURRENT
LOCAL, STATE AND FEDERAL REGULATIONS.

Disclaimer (provided with this information by the compiling agencies):
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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

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

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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

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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

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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.

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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 TPO.

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 depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

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

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

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

OSHA:

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

STATE

CAS# 7783-20-2 can be found on the following state right to know lists: New Jersey, Pennsylvania,

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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.

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FISHER SCIENTIFIC -- A-708, AMMONIUM TARTRATE -- 6810-00N015852

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

Product ID:A-708, AMMONIUM TARTRATE

MSDS Date:02/15/1989

FSC:6810

NIIN:00N015852

MSDS Number: BPLCB

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:1 REAGENT LANE

City:FAIR LAWN

State:NJ

ZIP:07410-2802

Country:US

Info Phone Num:201-796-7100

Emergency Phone Num:201-796-7100;800-424-9300 (CHEMTREC)

CAGE:1B464

=== Contractor Identification ===

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV

Address:1 REAGENT LANE

Box:City:FAIRLAWN

State:NJ

ZIP:07410-2802

Country:US

Phone:201-796-7100

CAGE:1B464

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

Ingred Name:ING 2:TO SKIN/EYES, & RESP TRACT. INGEST OF LG AMTS MAY
PRDCE GI IRRIT. HIGHLY TOX BY INTRAVENOUS RTE IN (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:EXPERIMENTAL ANIMALS.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: UNTIL NO EVIDENCE OF CHEM REMAINS FOR @ LST
15-20 MIN. GET MED ATTN IMMED. INGEST: DO NOT USE (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:GASTRIC LAVAGE/INDUCE VOMIT. DILUTE SUBSTANCE IMMED
W/LG QTY OF MILK/H*20. GET MED ATTN IMMED. (DREISBACH, (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:HANDBOOK OF POISONING, 11TH ED). ANTIDOTE: NO
SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY & SUPPORTIVELY.
RTECS #:9999999ZZ

Ingred Name:RESP PROT:FOUND IN PHYS DATA, HLTH EFTS & TOX SECTIONS.
THEY ARE RANKED IN ORDER FROM MINIMUM TO MAX RESP PROT: (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8:NIOSH/MSHA APPRVD: DUST & MIST RESP W/FULL FACEPIECE;
AIR-PURIFYING FULL FACEPIECE W/HIGH-EFFICIENCY (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9:PARTICULATE FILTER; POWDERED AIR-PURIFYING RESP

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W/TIGHT-FITTING FACEPIECE & HIGH-EFFICIENCY PARTICULATE (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10:FILTER. TYPE 'C' SUPPLIED-AIR RESP W/FULL FACEPIECE
OPERATED IN PRESS-DEMAND/OTHER POS PRESS MODE W/FULL (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11: FACEPIECE, HELMET/HOOD OPERATED IN CONTINUOUS-FLOW
MODE; SCBA W/FULL FACEPIECE OPERATED IN PRESS-DEMAND (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 12: OTHER POS PRESS MODE. FOR FIREFIGHTING & OTHER
IMMED DANGEROUS TO LIFE/HLT CNDTNS: NIOSH/MSHA APPRVD: (ING 14)
RTECS #:9999999ZZ

Ingred Name:ING 13:SCBA W/FULL FACEPIECE OPERATED IN PRESS DEMAND/OTHER
POS PRESS MODE; SUPPLIED-AIR RESP W/FULL FACEPIECE (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14:OPERATED IN PRESS-DEMAND/OTHER POS PRESS MODE IN
COMBINATION W/AN AUXILIARY SCBA OPERATED IN PRESS-DEMAND(ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15:OR OTHER POSITIVE PRESSURE MODE.
RTECS #:9999999ZZ

Ingred Name:TARTARIC ACID, DIAMMONIUM SALT; (AMMONIUM TARTRATE)
CAS:3164-29-2
RTECS #:WW8050000
Fraction by Wt: 100%
EPA Rpt Qty:5000 LBS
DOT Rpt Qty:5000 LBS

Ingred Name:EFTS OF OVEREXP: SEV EXPOS MAY CAUSE GI PERFORATION.
CHRONIC: NO DATA AVAIL. DIAMMONIUM TARTRATE IS IRRITATING (ING 3)
RTECS #:9999999ZZ

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

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:INHAL: NO DATA AVAIL, HOWEVER,
INHAL OF SOME AMMONIUM SALTS MAY CAUSE IRRIT OF MOUTH, NOSE/THROAT.
SEV EXPOS MAY CAUSE WHEEZING, CHEST PAIN, & DELAYED PULM EDEMA.
CHRONIC: RPTD/PRLNG EXPOS MAY CAUSE IRRIT. SKIN:ACUTE: NO DATA
AVAIL, HOWEVER AMMONIUM SALTS MAY CAUSE RED, IRRIT & POSS CHEM
BURNS. (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HLTH HAZ: CHRONIC: NO DATA AVAIL, HOWEVER,
AMMONIUM SALTS AFTER RPTD/PRLNG CONT MAY CAUSE DERM. EYE: ACUTE:
CONT MAY CAUSE RED/IRRIT, SEV EXPOS MAY PRDCE BURNS. CHRONIC:
RPTD/PRLNG CONT MAY CAUSE CONJ . INGEST: ACUTE: NO DATA AVAIL,
HOWEVER, INGEST OF AMMONIUM SALTS MAY PRDCE, NAUS, VOMIT & GASTRIC
IRRIT. (ING 2)

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

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First Aid:INHAL:REMOVE TO FRESH AIR IMMED. IF BRTHG HAS STOPPED,
PERFORM ARTF RESP. KEEP WARM & @ REST. TREAT SYMPTOMATICALLY &
SUPPORTIVELY. GET MED ATTN IMMED. SKIN: REMOVE CONTAMD CLTHG &
SHOES IMMED. WASH A FFECTED AREA W/SOAP/MILD DETERGENT & LGAMTS OF
H*2O UNTIL NO EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MED
ATTN IMMED. EYE: WASH IMMED W/LG AMTS OF H*2O/NORM SALINE OCCAS
LIFTING LIDS, (ING 5)

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

Flash Point:COMBUST SOLID
Extinguishing Media:DRY CHEM/CO*2/HALON, H&2O SPRAY/STD FOAM. (1987
EMER RESPONSE GUIDEBOOK, DOT P5800.4). FOR LGR FIRES, USE (SUPP
DATA)
Fire Fighting Procedures:NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP. MOVE
CONTR FROM FIRE AREA IF POSS. DO NOT SCATTER SPILLED MATL W/HIGH
PRESS H*2O STREAMS. DIKE FIRE (SUPP DATA)
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO
HEAT OR FLAME.

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

Spill Release Procedures:STOP LEAK OF YOU CAN DO SO W/OUT RISK. FOR SM
SPILLS: TAKE UP W/SAND/OTHER ABSORB MATL & PLACE INTO CLEAN, DRY
CONTR FOR LATER DISP. KEEP UNNECESSARY PEOPLE AWAY. ISOLATE HAZARD
AREA AND DENY ENTRY.
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:SPEC RESP SELECTED MUST BE BASED ON CONTAM
LEVELS FOUND IN WORKPLACE, MUST NOT EXCEED WORKING LIM OF RESP & BE
JOINTLY APPRVD BY NATL INSTITUTE FOR OCCUP SFTY & HLTH & MINE SFTY
& HLTH ADMIN. FOLLOW R ESP ARE RECOM BASED ON DATA (ING 8)
Ventilation:PROVIDE GENERAL DILUTION VENTILATION.
Protective Gloves:IMPERVIOUS GLOVES.
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:EMPLOYEE MUST WEAR APPROP PROT(IMPERVIOUS)
CLTHG & EQUIP TO PVNT RPTD/PRLNG SKIN CONT W/THIS SUBSTANCE.
Work Hygienic Practices:CONTACT LENSES SHOULD NOT BE WORN.
Supplemental Safety and Health
EXTING MEDIA: H*2O SPRAY, FOG/STD FOAM (1987 EMER RESPONSE GUIDEBOOK,
DOT P 5800.4) FIRE FIGHT PROC: CTL H*2O FOR LATER DISP (1987 EMER
RESPONSE GUIDEBOOK, DOT P5800.4 GUIDE PG 31). USE AGENTS SUITABL E
FOR TYPE OF SURROUNDING FIRE. AVOID BRTHG HAZ VAP, KEEP UPWIND.

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

HCC:N1
Boiling Pt:B.P. Text:DECOMPOSES
Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES
Spec Gravity:1.6

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Solubility in Water:58.01%@15C

Appearance and Odor:COLORLESS CRYSTALS OR WHITE GRANULES.

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

Stability Indicator/Materials to Avoid:YES

DIAMMONIUM TARTRATE (AMMONIUM TARTRATE): MAY EXPLODE VIOLENTLY ON CONTACT WITH POTASSIUM CHLORATE.

Stability Condition to Avoid:MAY BURN BUT DOES NOT IGNITE READILY. AVOID CONTACT WITH STRONG OXIDIZERS, EXCESSIVE HEAT, SPARKS, OR OPEN FLAME.

Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE CORROSIVE FUMES OF AMMONIA AND TOXIC OXIDES OF NITROGENS.

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

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS .

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Material Safety Data Sheet

Ammonium Thiocyanate

ACC# 01450

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Thiocyanate

Catalog Numbers: AC206500000, AC206500010, AC206505000, AC423410000, AC423410030, AC423410050, 42341-5000, A709-3, A709-500

Synonyms: Thiocyanic acid; ammonium salt; Ammonium rhodanate; Ammonium sulfocyanate; Ammonium sulfocyanide; Ammonium thiocyanate; Ammonium rhodanide.

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
1762-95-4	Ammonium thiocyanate	>97.5	217-175-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Causes respiratory tract irritation. Causes eye and skin irritation. Contact with acids liberates toxic gas. May be harmful if swallowed, inhaled, or absorbed through the skin. Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, eyes, thyroid, skin.

Potential Health Effects

Eye: May cause moderate eye irritation.

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

Ingestion: Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause agitation, delirium, convulsions, low blood pressure, anxiety and even unconsciousness and

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death.

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

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may cause thyroid damage: thyroid enlargement, decrease in metabolic rate, and hypothyroidism. Repeated exposure can cause headache, nausea, vomiting, loss of appetite and weight

Section 4 - First Aid Measures

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

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

Ingestion: 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: Use water spray, dry chemical, "alcohol resistant" foam, or carbon dioxide.

Flash Point: 190 deg C (374.00 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

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

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

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
Ammonium thiocyanate	none listed	none listed	5 mg/m ³ TWA (listed under Cyanide anion).

OSHA Vacated PELs: Ammonium thiocyanate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: white

Odor: odorless

pH: 4.5-6.0 in 5% sol.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 149 deg C

Decomposition Temperature: 190 deg C

Solubility: Freely Soluble.

Specific Gravity/Density: 1.305 g/cm³

Molecular Formula: NH₄SCN

Molecular Weight: 76.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. May decompose when exposed to light.

Conditions to Avoid: Dust generation, moisture, excess light.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, brass, copper, iron.

Hazardous Decomposition Products: Hydrogen cyanide, nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide, ammonia and/or derivatives.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 1762-95-4: XK7875000

LD50/LC50:

CAS# 1762-95-4:

Oral, mouse: LD50 = 500 mg/kg;

Oral, mouse: LD50 = 720 mg/kg;

Oral, rat: LD50 = 750 mg/kg;

Carcinogenicity:

CAS# 1762-95-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Acute aquatic effect: 96-hour LC50; fathead minnow: 100 mg/L 96-hour LC50; water flea: 170 mg/L 48-hour LC50; mosquito fish: 420 mg/L

Environmental: This chemical has a low biological oxygen demand, and it is expected to cause little oxygen depletion in aquatic systems. It has a low potential to affect aquatic organisms. It is not likely to bioconcentrate.

Physical: No information available.

Other: No information available.

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Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SO (AMMONIUM THIOCYANATE)
Hazard Class:	XCP	9
UN Number:		UN3077
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1762-95-4 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

CAS# 1762-95-4: 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 # 1762-95-4: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

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This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 1762-95-4 is listed as a Hazardous Substance under the CWA. CAS# 1762-95-4 is listed as a Priority Pollutant under the Clean Water Act. CAS# 1762-95-4 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# 1762-95-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

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

R 32 Contact with acids liberates very toxic gas.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

S 50A Do not mix with acids.

WGK (Water Danger/Protection)

CAS# 1762-95-4: 1

Canada - DSL/NDSL

CAS# 1762-95-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, 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# 1762-95-4 (listed as Cyanides, inorganic salts) is listed on the Canadian Ingredient Disclosure List.

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CAROLINA BIOLOGICAL SUPPLY CO -- CHARCOAL, WOOD AND ANIMAL BONE, POWDER -- -

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

Product ID:CHARCOAL, WOOD AND ANIMAL BONE, POWDER
MSDS Date:02/02/1998
FSC:NIIN:Submitter:D RV
Status Code:A
MSDS Number: CKBKV
==== Responsible Party ====
Company Name:CAROLINA BIOLOGICAL SUPPLY CO
Address:2700 YORK RD
City:BURLINGTON
State:NC
ZIP:27215-3387
Country:US
Info Phone Num:800-227-1150
Emergency Phone Num:800-227-1150
Resp. Party Other MSDS Num.:PRODUCT CODE: 85-3780
CAGE:59896

==== Contractor Identification ====

Company Name:CAROLINA BIOLOGICAL SUPPLY CO
Address:2700 YORK RD
Box:City:BURLINGTON
State:NC
ZIP:27215-3387
Country:US
Phone:800-227-1150/910-584-0381
Contract Num:MDA414-99-P-6483
CAGE:59896

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

Ingred Name:CARBON
CAS:7440-44-0
RTECS #:FF5250000
= Wt:100.

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

LD50 LC50 Mixture:LD50 = 440 MG/KG (RAT)
Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EMERGENCY OVERVIEW: COMBUSTIBLE SOLID.
POTENTIAL HEALTH EFFECT: ON CONTACT MAY CAUSE EYES OR SKIN
IRRITATION. INGESTED, MAY CAUSE GASTROINTESTINAL DISCOMFORT.
INHALED, MAY CAUSE IRRITATION TO RESPIRATORY TRACT.
Explanation of Carcinogenicity:NONE LISTED.
Effects of Overexposure:IRRITATION.

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

First Aid:EYE: FLUSH WITH WATER FOR AT LEAST 15 MINUTES, RAISING UPPER
AND LOWER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION IF
IRRITATION PERSISTS. SKIN: THOROUGHLY WASH EXPOSED AREA FOR AT
LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING. LAUNDRY BEFORE
REUSE. INGEST: IF CONSCIOUS, GIVE PLENTY OF WATER AND INDUCE
VOMITING IMMEDIATELY AS DIRECTED BY MEDICAL PERSONNEL. CALL A
PHYSICIAN OR POISON CONTROL CENTER. NEVER GIVE ANYTHING BY MOUTH

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TO AN UNSCIOUS PERSON. INHALE: REMOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. KEEP PERSON WARM AND QUIET.

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

Extinguishing Media:USE DRY CHEMICAL, CARBON DIOXIDE OR APPROPRIATE FOAM.

Fire Fighting Procedures:FIREFIGHTERS SHOULD WEAR FULL PROTECTIVE EQUIPMENT AND NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS.

Unusual Fire/Explosion Hazard:DUST PARTICLES CAN FORM EXPLOSIVE MIXTURE WITH AIR. DANGER DUE TO SPONTANEOUS HEATING WHEN WET OR TIGHTLY PACKED.

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

Spill Release Procedures:VENTILATE AREA OF SPILL. CLEAN-UP PERSONNEL SHOULD WEAR PROPER PROTECTIVE EQUIPMENT. AVOID CREATING DUST. SWEEP OR SCOOP UP AND CONTAINERIZE FOR DISPOSAL.

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

Handling and Storage Precautions:KEEP CONTAINER CLOSED AND AWAY FROM HEAT, FLAMES, AND OXIDIZERS. AVOID WETTING AND SUBSEQUENT DRYING IN STORAGE.

Other Precautions:DO NOT BREATHE DUST. AVOID CONTACT WITH SKIN OR EYES.

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

Respiratory Protection:NONE NEEDED UNDER NORMAL CONDITIONS OF USE WITH ADEQUATE VENTILATION. NIOSH APPROVED EQUIPMENT SHOULD BE WORN IF LEVELS ARE EXCEEDED.

Ventilation:MECHANICAL TYPE IS ACCEPTABLE. LOCAL EXHAUST IS PREFERRED.

Protective Gloves:RUBBER, NEOPRENE, PVC, OR EQUIVALENT.

Eye Protection:SPLASH PROOF CHEMICAL SAFETY GOGGLES SHOULD BE WORN AT ALL TIMES.

Other Protective Equipment:LAB COAT, EYE WASH AND SAFETY SHOWERS.

Supplemental Safety and Health

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

HCC:R1

Melt/Freeze Pt.=3500.C, #####F

Solubility in Water:INSOLUBLE

Appearance and Odor:BLACK, ODORLESS, AMORPHOUS POWDER.

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

Stability Indicator/Materials to Avoid:YES

OXIDIZERS.

Stability Condition to Avoid:AVOID DUSTING.

Hazardous Decomposition Products:OXIDES OF CARBON.

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

Ecological:EPA WASTE NUMBER: D001

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

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Waste Disposal Methods:DISPOSE IN ACCORDANCE WITH ALL APPLICABLE
FEDERAL, STATE AND LOCAL REGULATIONS.

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

Transport Information:DOT: CHARCOAL, HAZARD CLASS 4.2, NA1361, PKG III.

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

SARA Title III Information:NOT ON SARA SEC. 313 CHEMICALS LIST.

Federal Regulatory Information:ON TSCA INVENTORY LIST.

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particular situation.

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FISHER SCIENTIFIC -- ANTIMONY POTASSIUM TARTRATE, A867250 -- 6810-00N026769

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

Product ID:ANTIMONY POTASSIUM TARTRATE, A867250
MSDS Date:10/29/1991
FSC:6810
NIIN:00N026769
MSDS Number: BNLCR
=== 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:ING 4: MANIFESTATIONS. CHRONIC INCORPORATION OF ANTIMONY
POTASSIUM TARTRATE AT 5 PPM INTO DRINKING H*2O INCR (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5: MORTALITY RATE & DECREASED SERUM GLUCOSE LEVELS IN
RATS.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: SECURELY, BUT NOT TOO TIGHTLY. GET MED ATTN
IMMED. EYE: WASH EYES IMMED W/LRG AMTS OF H*2O, (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7:OCCASIONALLY LIFTING UPPER/LOWER LIDS FOR AT LEAST 15
MIN,UNTIL NO EVIDENCE OF CHEM REMAINS.CONT IRRIGATING(ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8:W/NORMAL SALINE UNTIL PH HAS RETURNED TO NORMAL
(30-60 MIN). COVER W/STERILE BANDAGES.GET MED ATTN IMMED. (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9: INGEST: REMOVE INGESTED ANTIMONY CMPDS BY GASTRIC
LAVAGE/EMESIS. DO NOT PERFORM GASTRIC LAVAGE/EMESIS IF (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10:VICTIM IS UNCON.GET MED ATTN IMMED. TREATMENT SHD BE
PERFORMED BY QUALIFIED MED PERSONNEL ONLY. ANTIDOTE:(ING 12)
RTECS #:9999999ZZ

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Ingred Name:ING 11: FOLLOWING ANTIDOTE HAS BEEN RECOM. HOWEVER,
DECISION AS TO WHETHER SEVERITY OF POISONING REQS ADMIN OF (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 12: ANY ANTIDOTE & ACTUAL DOSE REQD SHD BE MADE BY
QUALIFIED MED PERSONNEL. ANTIMONY POISONING: ADMIN (ING 14)
RTECS #:9999999ZZ

Ingred Name:ING 13: DIMERCAPROL, 3 MG/KG (OR 0.3 ML/10 KG) EVERY 4
HOURS FOR FIRST 2 DAYS & THEN 2 MG/KG EVERY 12 HOURS FOR (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14:TOTAL OF 10 DAYS. DIMERCAPROL IS AVAIL AS 10% SOLN
IN OIL FOR INTRAMUSCULAR ADMIN. ANTIDOTE SHD BE ADMIN (ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15: BY QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

Ingred Name:MATL:BICHLORIDE,OXIDIZERS,TANNIC ACID,ACIDS:MAY RELEASE HAZ
& TOXIC STIBINE;TRIVALENT ANTIMONY & PERCHLORIC ACID-ING 18
RTECS #:9999999ZZ
Other REC Limits:NONE SPECIFIED

Ingred Name:ING-17: EXPLOSIVE MIXTURE WHEN HOT.
RTECS #:9999999ZZ
Other REC Limits:NONE SPECIFIED

Ingred Name:ANTIMONY POTASSIUM TARTRATE (SARA III)
CAS:28300-74-5
RTECS #:CC6825000
Fraction by Wt: 100%
OSHA PEL:0.5 MG (SB)/M3
ACGIH TLV:0.5 MG (SB)/M3
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS

Ingred Name:SUPP DATA: MOIST AREAS OF BODY, RARELY INCL FACIAL REGION.
EYE: RPTD/PRLNGD CONT W/IRRIT MAY CAUSE CONJUNCT. (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2: INGEST: RPTD/PRLNGD INGEST OF ANTIMONY CMPDS MAY
CAUSE NAUS, ANOREXIA, HDCH, SLEEPLESSNESS, DIZZ & LOWERED(ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3: BODY TEMP. LIVER & KIDNEY DEGENERATIVE CHANGES INCL
HEMORRHAGIC NEPHRITIS & HEPATITIS W/JAUNDICE ARE LATE (ING 5)
RTECS #:9999999ZZ

==== Hazards Identification =====

LD50 LC50 Mixture:LD50: (ORAL,RAT) 115 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:(ACUTE) INHAL: INHAL MAY CAUSE MUC
MEMB IRRIT W/SORE THROAT, COUGHING & DYSPNEA. SKIN: CONT W/ANTIMONY
CMPDS MAY CAUSE IRRIT W/REDNESS, PAIN & POSS ULCERATION. EYE: CONT
MAY CAUSE IRRIT W/REDNESS & PA IN. KERATITIS & ULCERATION HAVE BEEN

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REPORTED FROM EXPOS TO ANTIMONY CMPDS. INGEST: INGEST OF ANTIMONY
(EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT.

Effects of Overexposure:HLTH HAZ: CMPDS MAY CAUSE VIOLENT IRRIT OF
NOSE, MOUTH, STOMACH & INTESTINES, NAUS, VOMIT, SEV DIARR W/MUC &
BLOOD & ABDOMINAL CRAMPS. SLOW & SHALLOW RESP, PULM CONGESTION,
MUSCULAR PAIN, SHOCK, COLLA PSE & COMA MAY OCCUR. DEATH MAY OCCUR
DUE TO CIRCULATORY & RESP FAILURE A FEW HOURS FOLLOWING INGEST.
HUMAN (SUPP DATA)

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

First Aid:INHAL: REMOVE FROM EXPOS AREA TO FRESH AIR IMMED. IF BRTHG
HAS STOPPED, PERFORM ARTF RESP. KEEP PERSON WARM & AT REST. TREAT
SYMP & SUPPORTIVELY. GET MED ATTN IMMED. SKIN: REMOVE CONTAM CLTHG
& SHOES IMMED. WASH AFFECTED AREA W/SOAP/MILD DETERGENT & LRG AMTS
OF H*2O UNTIL NO EVIDENCE OF CHEM REMAINS (AT LEAST 15-20 MIN). IN
CASE OF CHEM BURNS, COVER AREA W/STERILE, DRY DRESSING. BANDAGE
(ING 7)

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

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR
REGULAR FOAM. FOR LRGR FIRES, USE WATER SPRAY, FOG OR REGULAR FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP
. MOVE CNTNR FROM FIRE AREA IF YOU CAN DO IT W/OUT RISK. EXTING
USING AGENT INDICATED; KEEP (SUPP DATA)
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO
HEAT OR FLAME.

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

Spill Release Procedures:KEEP SPARKS, FLAME, AND OTHER SOURCES OF
IGNITION AWAY. KEEP MATERIAL OUT OF WATER SOURCES AND SEWERS.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE
SUBSTANCES. OBSERVE ALL FED, ST & LOC REGS WHEN STORING OF
SUBSTANCE.
Other Precautions:FOR ASSISTANCE, CONTACT DISTRICT DIRECTOR OF
ENVIRONMENTAL PROTECTION AGENCY.

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

Respiratory Protection:WEAR NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE
FOR EXPOSURE OF CONCERN . REFER TO ORIGINAL MSDS FOR FURTHER
INFORMATION .
Ventilation:PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO
MEET PUBLISHED EXPOSURE LIMITS.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:APPROPRIATE IMPERVIOUS PROTECTIVE CLOTHING
AND EQUIPMENT. EMERGENCY EYE WASH.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health

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FIRE FIGHT PROC: UPWIND. AVOID BRTHG VAPS/DUST. EFTS OF OVEREXP:
PATHOLOGIC FINDINGS MAY INCL ULCERATIONS OF ESOPHAGUS & STOMACH. IN
SUBACUTE CASES, FATTY DEGENERATION OF LIVER, KIDNEY, & HEART MAY BE
PRESENT. (CHRONIC) SKIN: RPTD/PRLNGD CONT W/ANTIMONY CMPDS MAY
CAUSE DERM & PAPULES, PUSTULES/LESIONS ON EXPOS (ING 2)

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

HCC:T4
Melt/Freeze Pt:M.P/F.P Text:212F,100C
Spec Gravity:2.6 @ 20C
pH:5-6
Solubility in Water:8.3%
Appearance and Odor:WHITE POWDER OR COLORLESS CRYSTALS WITH SWEET,
METALLIC TASTE.

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

Stability Indicator/Materials to Avoid:YES
ACACIA,ALKALIES & THEIR CARBONATES,ANTIPYRINE,ASTRINGENT INFUSIONS,
HALOGENATED ACIDS,LEAD SALTS,MERCURY (ING-17)
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:TOXIC OXIDES OF ANTIMONY AND CARBON.

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

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS
WHEN DISPOSING OF SUBSTANCE. FOR ASSISTANCE, CONTACT DISTRICT
DIRECTOR OF ENVIRONMENTAL PROTECTION AGENCY.

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EM SCIENCE -- BAKING SODA, SODIUM ACID CARBONATE, SX0318 -- 6810-00N049713

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

Product ID:BAKING SODA, SODIUM ACID CARBONATE, SX0318

MSDS Date:12/10/1992

FSC:6810

NIIN:00N049713

MSDS Number: BVHZC

=== Responsible Party ===

Company Name:EM SCIENCE

Address:480 DEMOCRAT RD

Box:70

City:GIBBSTOWN

State:NJ

ZIP:08027

Country:US

Info Phone Num:609-345-9200

Emergency Phone Num:800-424-9300 (CHEMTREC)

CAGE:DO242

=== Contractor Identification ===

Company Name:E M SCIENCE

Address:480 DEMOCRATE RD

Box:70

City:GIBBSTOWN

State:NJ

ZIP:08027

Country:US

Phone:609-354-9200/800-424-9300 (CHEMTREC)

CAGE:OSK29

Company Name:EM SCIENCE

Address:480 DEMOCRAT RD

City:GIBBSTOWN

State:NJ

ZIP:08927

Phone:800-424-9300 (CHEMTREC)

CAGE:DO242

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

Ingred Name:SODIUM BICARBONATE (1:1)

CAS:144-55-8

RTECS #:VZ0950000

Fraction by Wt: 100%

OSHA PEL:N/K

ACGIH TLV:N/K

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

LD50 LC50 Mixture:LD50:(ORAL,RAT) 4220 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:MAY CAUSE EYE IRRITATION. TESTS ON
LABORATORY ANIMALS INDICATE MATERIAL MAY PRODUCE ADVERSE MUTAGENIC
& REPRODUCTIVE EFFECTS.

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:SEE HEALTH HAZARDS.

Medical Cond Aggravated by Exposure:NONE INDICATED.

Material Safety Data Sheets, Carver Hall RM 208-A

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

First Aid:GET MEDICAL ASSISTANCE IF ANY ADVERSE EFFECTS SHOULD DEVELOP.
SKIN:WASH THOROUGHLY W/SOAP & WATER. EYE:IMMEDIATELY FLUSH
THOROUGHLY W/WATER FOR AT LEAST 15 MINUTES. INHAL:REMOVE TO FRESH
AIR; GIVE ART IFICIAL RESPIRATION IF BREATHING HAS STOPPED.
INGEST:GET IMMEDIATE MEDICAL ATTENTION; IF CONSCIOUS, GIVE WATER
FREELY.

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

Flash Point:NONFLAMMABLE
Extinguishing Media:WATER.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT .
Unusual Fire/Explosion Hazard:NONE INDICATED.

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

Spill Release Procedures:EVACUATE AREA OF ALL UNNEC PERS. WEAR SUITABLE
PROT EQUIP LISTED UNDER EXPOS/PERSONAL PROT. ELIM ANY IGNIT SOURCES
UNTIL AREA IS DETERMINED TO BE FREE FROM EXPLO/FIRE HAZS. CONTAIN
RELS & ELIM ITS SOU RCE, IF THIS CAN BE DONE W/OUT RISK. TAKE
(SUPDAT)
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:KEEP CONTAINER CLOSED. STORE AT
CONTROLLED ROOM TEMPERATURE. DO NOT GET IN EYES. DO NOT TAKE
INTERNALLY.
Other Precautions:HANDLING CARE GENERALLY IN KEEPING W/SAFE LABORATORY
PRACTICES IS RECOMMENDED.

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

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN .
Ventilation:MATERIAL SHOULD BE HANDLED OR TRANSFERRED IN AN APPROVED
FUME HOOD OR W/ADEQUATE VENTILATION.
Protective Gloves:NEOPRENE OR EQUIVALENT GLOVES.
Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .
Other Protective Equipment:EYE WASH & SAFETY EQUIPMENT SHOULD BE
READILY AVAILABLE.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
MP:252F,122C (DECOMPOSES). SPILL PROC:UP & CONTAINERIZE FOR PROPER DISP
AS DESCRIBED UNDER DISP. COMPLY W/FED, STATE & LOC REGS ON
REPORTING RELS. REFER TO REGULATORY INFO FOR REPORTABLE QTY & OTHER
R EGULATORY DATA.

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

Melt/Freeze Pt:M.P/F.P Text:SUPP DATA
Spec Gravity:2.16 (H*20=1)
Solubility in Water:SOLUBLE
Appearance and Odor:WHITE CRYSTALLINE POWDER; ODORLESS.

Material Safety Data Sheets, Carver Hall RM 208-A

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

Stability Indicator/Materials to Avoid: YES
ACIDS. REACTS VIOLENTLY W/AMMONIUM PHOSPHATE, MONOBASIC.
Stability Condition to Avoid: NONE INDICATED.
Hazardous Decomposition Products: CO*X.

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

Waste Disposal Methods: MATL DOES NOT HAVE EPA WASTE NUMBER & IS NOT A LISTED WASTE, HOWEVER, CONSULTATION W/PERMITTED WASTE DISPOSAL SITE (TSD), SHOULD BE ACCOMPLISHED. ALWAYS CONTACT PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE W/ALL CURRENT LOC, STATE & FED REGS.

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Material Safety Data Sheet
Canada balsam, neutral, filtered.

ACC# 04145

Section 1 - Chemical Product and Company Identification

MSDS Name: Canada balsam, neutral, filtered.

Catalog Numbers: 61232-1000, B10-100

Synonyms: Fir, balsam.

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
8007-47-4	Canada balsam	100	232-362-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to green liquid.

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

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

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

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

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

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

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

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist.

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

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Canada balsam	none listed	none listed	none listed

OSHA Vacated PELs: Canada balsam: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

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

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

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: yellow to green

Odor: fresh green odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: >1

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 0.98

Molecular Formula: Varies

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents.

Material Safety Data Sheets, Carver Hall RM 208-A

Hazardous Decomposition Products: Oxides of carbon.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 8007-47-4: CP2352500

LD50/LC50:

CAS# 8007-47-4:

Oral, rat: LD50 = >5 gm/kg;

Skin, rabbit: LD50 = >5 gm/kg;

Carcinogenicity:

CAS# 8007-47-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
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Material Safety Data Sheets, Carver Hall RM 208-A

Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 8007-47-4 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 8007-47-4: immediate.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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# 8007-47-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 8007-47-4: No information available.

Canada - DSL/NDSL

CAS# 8007-47-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled. .

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

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Barium carbonate

ACC# 02340

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium carbonate

Catalog Numbers: AC192520000, AC192520050, AC192520250, AC217490000, AC217495000, AC423440000, AC423445000, B30-100, B30-3, B30-500

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
513-77-9	Barium carbonate	>99	208-167-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to gray white powder.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. May cause lung damage. May cause kidney damage. May cause cardiac disturbances. May cause adverse reproductive effects based upon animal studies.

Target Organs: Heart, liver, gastrointestinal system, muscles.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: May cause liver damage. Human fatalities have been reported from acute poisoning. 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

Material Safety Data Sheets, Carver Hall RM 208-A

muscular stimulation with tingling in the extremities. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities.

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

Chronic: Prolonged or repeated skin contact may cause dermatitis. Adverse reproductive effects have been reported in animals. Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

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

Skin: Get medical aid if irritation develops or persists. Rinse area with large amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: 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: If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Section 5 - Fire Fighting Measures

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

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 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.

Material Safety Data Sheets, Carver Hall RM 208-A

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

Section 7 - Handling and Storage

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

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

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barium carbonate	none listed	none listed	none listed

OSHA Vacated PELs: Barium 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 impervious gloves.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white to gray white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.

Material Safety Data Sheets, Carver Hall RM 208-A

Boiling Point: Not available.
Freezing/Melting Point: 811 deg C
Decomposition Temperature: Not available.
Solubility: Negligible in water.
Specific Gravity/Density: 4.29 (Water=1)
Molecular Formula: BaCO₃
Molecular Weight: 197.35

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.

Incompatibilities with Other Materials: 2-Furanpercarboxylic acid and bromine trifluoride.

Hazardous Decomposition Products: Carbon dioxide, barium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 513-77-9: CQ8600000; CQ8670000

LD50/LC50:

CAS# 513-77-9:

Oral, mouse: LD50 = 200 mg/kg;

Oral, mouse: LD50 = 200 mg/kg;

Oral, rat: LD50 = 418 mg/kg;

Oral, rat: LD50 = 418 mg/kg;

Carcinogenicity:

CAS# 513-77-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No information available.

Reproductive Effects: Maternal: oogenesis/ovaries/fallopian tubes, 1hl, rat TCLo=3130 ug/m³/24H (female 16W pre) Paternal: Spermatogenesis/testes/sprem duct, 1hl, rat TCLo=1150 ug/m³/24H (male 16W)

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Material Safety Data Sheets, Carver Hall RM 208-A

Ecotoxicity: No data available. No information available.

Environmental: Marine animals concentrate the element 7-100 times, and marine plants 1000 times from seawater. ... Soybeans and tomatoes also accumulate soil barium 2-20 times. Adsorption of barium was measured in a sandy soil and a sandy loam soil at concn levels closely corresponding to those to be expected for field conditions. In general, sludge solutions appeared to incr the mobility of elements in a soil. This is due to a combination of complexation by dissolved organic cmpd, high background concn and high ionic strengths of the soil solution.

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 NOS (BARIUM CARBONATE)
Hazard Class:	6.1	6.1
UN Number:	UN1564	UN1564
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 513-77-9 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.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 12b

None of the chemicals are listed under TSCA Section 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 # 513-77-9: immediate, delayed.

Section 313

This material contains Barium carbonate (listed as Barium compounds, n.o.s.), >99%, (CAS# 513-77-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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# 513-77-9 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:

XN

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 28 After contact with skin, wash immediately with...

WGK (Water Danger/Protection)

CAS# 513-77-9: 0

Canada - DSL/NDSL

CAS# 513-77-9 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# 513-77-9 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Barium chloride, anhydrous

ACC# 02370

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium chloride, anhydrous

Catalog Numbers: AC612281000, B31-100C, B31-500, B35

Synonyms: Barium dichloride.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10361-37-2	Barium chloride	> 97	233-788-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. May cause lung damage. May cause cardiac disturbances. May cause kidney damage.

Target Organs: Kidneys, heart, respiratory system, muscles.

Potential Health Effects

Eye: Contact produces irritation, tearing, and burning pain. May cause conjunctivitis.

Skin: Causes skin irritation. Prolonged contact with the skin, especially if the skin is wet or moist, causes necrosis.

Ingestion: Harmful if swallowed. May cause kidney damage. The barium ion is a muscle poison causing stimulation and then paralysis. Initial symptoms are gastrointestinal, including nausea, vomiting, colic, and diarrhea, followed by myocardial and general muscular stimulation with tingling in the extremities. Barium chloride affects the muscles (especially the smooth muscles of the cardiovascular and respiratory

Material Safety Data Sheets, Carver Hall RM 208-A

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

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Wash thoroughly after 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

Material Safety Data Sheets, Carver Hall RM 208-A

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.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 13 - Disposal Considerations

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

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.

Material Safety Data Sheets, Carver Hall RM 208-A

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# 10361-37-2 can be found on the following state right to know lists: New Jersey, (listed as Barium compounds, n.o.s.), Pennsylvania, (listed as Barium compounds, n.o.s.).

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 25 Toxic if swallowed.

R 20 Harmful by inhalation.

Safety Phrases:

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

WGK (Water Danger/Protection)

CAS# 10361-37-2: 1

Canada - DSL/NDSL

CAS# 10361-37-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

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

Canadian Ingredient Disclosure List

CAS# 10361-37-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Barium hydroxide, anhydrous

ACC# 02420

Section 1 - Chemical Product and Company Identification

MSDS Name: Barium hydroxide, anhydrous

Catalog Numbers: 61242-2500, 61242-5000, B47-250, B47-500

Synonyms: Barium dihydroxide.

Material Safety Data Sheets, Carver Hall RM 208-A

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
17194-00-2	Barium hydroxide anhydrous	>95	241-234-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: transparent solid.

Danger! Causes burns by all exposure routes. Harmful if inhaled or swallowed. May cause blood abnormalities. May cause kidney damage. May cause central nervous system effects.

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

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause respiratory failure. May cause kidney failure. May cause convulsions, increased blood pressure, muscle spasms, and possible paralysis.

Inhalation: Harmful if inhaled. Causes chemical burns to the respiratory tract.

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

Section 4 - First Aid Measures

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

Material Safety Data Sheets, Carver Hall RM 208-A

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

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

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

Section 8 - Exposure Controls, Personal Protection

Material Safety Data Sheets, Carver Hall RM 208-A

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Barium hydroxide anhydrous	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).	0.5 mg/m ³ TWA (as Ba, except barium sulfate) (listed under Barium, soluble compounds).	0.5 mg/m ³ TWA (as Ba) (listed under Barium, soluble compounds).

OSHA Vacated PELs: Barium hydroxide anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

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

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

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: transparent

Odor: odorless

pH: Alkaline.

Vapor Pressure: Negligible.

Vapor Density: 10.9

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 780 deg C

Freezing/Melting Point: 78 deg C

Decomposition Temperature: Not available.

Solubility: Moderately in water (5.6 g/100 ml)

Specific Gravity/Density: 2.18

Molecular Formula: BaH₂O₂

Molecular Weight: 171.34

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Substance readily absorbs carbon dioxide from air.

Material Safety Data Sheets, Carver Hall RM 208-A

Conditions to Avoid: Dust generation, excess heat.

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

Hazardous Decomposition Products: Barium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 17194-00-2: CQ9200000

LD50/LC50:

CAS# 17194-00-2:

Oral, rat: LD50 = 308 mg/kg;

Carcinogenicity:

CAS# 17194-00-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

Material Safety Data Sheets, Carver Hall RM 208-A

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLIDS, TOXIC, N.O.S.	CORROSIVE SOLID, TOXIC, N.O.S.
Hazard Class:	8	8
UN Number:	UN2923	UN2923
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 17194-00-2 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 17194-00-2: immediate, delayed.

Section 313

This material contains Barium hydroxide anhydrous (listed as Barium compounds, n.o.s.), >95%, (CAS# 17194-00-2) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

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

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

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

OSHA:

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

STATE

CAS# 17194-00-2 can be found on the following state right to know lists: California, (listed as Barium, soluble compounds), New Jersey, (listed as Barium compounds, n.o.s.), Pennsylvania, (listed as Barium compounds, n.o.s.), Minnesota, (listed as Barium, soluble compounds).

California Prop 65

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

Material Safety Data Sheets, Carver Hall RM 208-A

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 34 Causes burns.

Safety Phrases:

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

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

WGK (Water Danger/Protection)

CAS# 17194-00-2: 1

Canada - DSL/NDSL

CAS# 17194-00-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, E.

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

Canadian Ingredient Disclosure List

CAS# 17194-00-2 (listed as Barium, soluble compounds) is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC CO -- BARIUM NITRATE -- 6810-00-174-9658

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

Product ID: BARIUM NITRATE

MSDS Date: 10/13/1989

FSC: 6810

NIIN: 00-174-9658

MSDS Number: BMDMR

=== Responsible Party ===

Company Name: FISHER SCIENTIFIC CO

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

Preparer's Name: GASTON 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

Material Safety Data Sheets, Carver Hall RM 208-A

Phone:201-796-7100
CAGE:1B464

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

Ingred Name:BARIUM NITRATE
CAS:10022-31-8
RTECS #:CQ9625000
Fraction by Wt: 100%
Other REC Limits:NONE SPECIFIED

==== Hazards Identification =====

LD50 LC50 Mixture:ORAL LD50 (RAT) IS 355 MG/KG
Routes of Entry: Inhalation:NO Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: INHALATION- IRRITATION OF
RESPIRATORY SYSTEM. SAME AS INGESTION. EYES- IRRITATION. SKIN-
IRRITATION. INGESTION- SEVERE GI TRACT IRRITATION, HYPOKALEMIA, CNS
DEPRESSION, KIDNEY DAMAGE OR FAILURE . CHRONIC: ANEMIA, NEPHRITIS,
CONJUNCTIVITIS.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:INHALATION: SORE THROAT, COUGHING, LABORED
BREATHING. EYES: BURNING SENSATION, STINGING, REDNESS, TEARING.
SKIN: REDNESS, ITCHING, PAIN. INGESTION: NAUSEA, VOMITING,
DIARRHEA, METALLIC TASTE, DIZZINES S, CONVULSIVE TREMORS, RINGING
IN EARS,POSSIBLE PARALYSIS, WEAKNESS.
Medical Cond Aggravated by Exposure:PRE-EXISTING CHRONIC REPIRATORY,
CARDIVASCULAR, OR SKIN DISEASES.

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

First Aid:INHALATION: REMOVE TO FRESH AIR. RESUSCITATE IF NEEDED. GET
IMMEDIATE MEDICAL ATTENTION. EYES: FLUSH WITH WATER FOR 15 MINUTES.
SEE DOCTOR. SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND
WATER . INGESTION: INDUCE VOMITING. GET MEDICAL ATTENTION
IMMEDIATELY. TREAT SUPPOTIVELY AND SYSTEMATICALLY.

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

Flash Point:NONE
Extinguishing Media:DRY CHERMICAL, CARBON DIOXIDE, HALON, WATER SPRAY
Fire Fighting Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS AND
FULL PROTECTIVE GEAR. REMOVE CONTAINERS FROM FIRE IF IT CAN BE DONE
AT NO RISK.
Unusual Fire/Explosion Hazard:OXIDIZER. RELEASES OXYGEN ON BEING
HEATED. HEATING COULD RESULT IN IGNITION, VIOLENT COMBUSTION, OR
EXPLOSION.

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

Spill Release Procedures:ISOLATE AREA AND DENY ENTRY. DO NOT TOUCH
SPILLED MATERIAL. KEEP COMBUSTIBLES AWAY FROM SPILL AREA. SCOOP UP
MATERIAL AND PLACE IN A CLEAN CONTAINER FOR LATER DISPOSAL. SUBJECT
TO SARA SECTION 313 ANN UAL TOXIC CHEMICAL RELEASE REPORTING.
Neutralizing Agent:SEE SUPPLEMENTAL INSTRUCTIONS.

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

Material Safety Data Sheets, Carver Hall RM 208-A

Handling and Storage Precautions:AVOID STORING ON WOODEN FLOORS.
SEPARATE FROM COMBUSTIBLES, ORGANIC, AND OTHER EASILY OXIDIZED
MATERIALS.

Other Precautions:PROTECT FROM PHYSICAL DAMAGE. IMMEDIATELY CLEAN UP
ANY SPILLS. AVOID CONTACT WITH EYES AND SKIN. MATERIAL MAY BE
POISONOUS OR CORROSIVE.

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

Respiratory Protection:USE NIOSH/MSHA APPROVED RESPIRATOR FOR DUSTS.
250 MG/M3 = IDLH; IF THIS IS SITUATION WEAR SELF-CONTAINED
BREATHING APPARATUS.

Ventilation:PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION.

Protective Gloves:PVC, NITRILE

Eye Protection:SAFETY GLASSES/CHEMICAL SPLASH GOGGLES

Other Protective Equipment:IMPERVIOUS CLOTHING TO PREVENT REPEATED OR
PROLONGED CONTACT. EYE WASH STATION & SAFETY SHOWER.

Work Hygienic Practices:WASH AFTER USE. DO NOT EAT, DRINK, OR SMOKE
UNTIL HANDS ARE WASHED. LAUNDRY CLOTHING BEFORE REUSE.

Supplemental Safety and Health

NEUTRALIZATION: AFTER SOOPING UP MATERIAL; RINSE AREA WITH WATER; APPLY
A SOLUTION OF ACIDIC FERROUS SULFATE (10 GMS FERROS SULFATE AND 2
ML SULFURIC ACID PER 100 ML WATER). LET REMAIN 5 MINUTES. ABSORB
ORINSE TO SEWER. TREAT WITH 20 % SODIUM BICARBONATE UNTIL BUBBLING
STOPS. REMOVE WASTES. RINSE WITH WATER.

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

HCC:D2

NRC/State Lic Num:NOT RELEVANT

Boiling Pt:B.P. Text:DECOMPOSES

Melt/Freeze Pt:=592.2C, #####F

Spec Gravity:3.24

Solubility in Water:APPRECIABLE

Appearance and Odor:ODORLESS, COLORLESS CRYSTALS

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

Stability Indicator/Materials to Avoid:YES

COMBUSTIBLES, REDUCING MATERIALS, PHOSPHATES, ESTERS, PHOPHOROUS, TIN
CHLORIDE

Stability Condition to Avoid:HIGH TEMPERATURES

Hazardous Decomposition Products:TOXIC OXIDES OF NITROGEN AND BARIUM

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

Waste Disposal Methods:CONTACT LOCAL ENVIRONMENTAL MANAGER. DISPOSE OF
IN ACCORDANCE WITH REQUIREMENTS OF 40 CFR 262, EPA HAZARDOUS WASTE
NUMBER D005. CERCLA SECTION 103 REPORTABLE QUANTITY= 100 LBS.
DISPOSE OF IN ACCORDANC E WITH LOCAL, STATE AND FEDERAL
REGULATIONS.

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Material Safety Data Sheets, Carver Hall RM 208-A

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

Bentonite

ACC# 02585

Section 1 - Chemical Product and Company Identification

MSDS Name: Bentonite

Catalog Numbers: B235-500

Synonyms: Bentonite magma; Southern bentonite; tixoton; VOLCLAY bentonite; Wilkinite.

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
1302-78-9	BENTONITE	100	215-108-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: cream to gray brown powder.

Warning! Causes eye, skin, and respiratory tract irritation. May cause cancer based on animal studies. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: Causes skin irritation.

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. The toxicological properties of this substance have not been fully investigated. When inhaled as a dust or fume, may cause benign pneumoconiosis. Can produce

Material Safety Data Sheets, Carver Hall RM 208-A

delayed pulmonary edema.

Chronic: May cause cancer according to animal studies. Effects may be delayed. Chronic inhalation may cause lung changes, chest pain, breath shortness, and bronchitis.

Section 4 - First Aid Measures

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

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

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container

Material Safety Data Sheets, Carver Hall RM 208-A

tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

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
BENTONITE	none listed	none listed	none listed

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

Personal Protective Equipment

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

Skin: Wear appropriate gloves to prevent skin exposure.

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

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

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: cream to gray brown

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Insoluble in water.

Specific Gravity/Density:Not available.

Molecular Formula:Not applicable.

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures. 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: Moisture, Increase volume significantly when water is added.

Hazardous Decomposition Products: Exposure to moist air or water.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1302-78-9: CT9450000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1302-78-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found. Effects of Bentonite in workers in processing plant experienced a very high incidence of bronchial asthma, (25%) in workers examined. This was attributed to the irritating action of the bentonite dust on the bronchial epithelium.

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

Material Safety Data Sheets, Carver Hall RM 208-A

	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# 1302-78-9 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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# 1302-78-9 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:

Material Safety Data Sheets, Carver Hall RM 208-A

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# 1302-78-9: No information available.

Canada - DSL/NDSL

CAS# 1302-78-9 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

Bismuth

ACC# 03180

Section 1 - Chemical Product and Company Identification

MSDS Name: Bismuth

Catalog Numbers: S75054, S79921

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
7440-69-9	Bismuth		231-177-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver- white or red solid.

Caution! May cause eye and skin irritation. May cause respiratory tract irritation. May cause digestive tract irritation with nausea, vomiting, and diarrhea. May cause central nervous system effects. May cause liver and kidney damage.

Target Organs: Kidneys, liver, nervous system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause mild skin irritation. Low hazard for usual industrial handling. Repeated or prolonged exposure may cause a bismuth line or black spots on the gums, foul breath and salivation.

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

Inhalation: May cause respiratory tract irritation.

Material Safety Data Sheets, Carver Hall RM 208-A

Chronic: Repeated or prolonged exposure may cause a bismuth line or black spots on the gums, foul breath and salivation.

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: 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. Flammable when exposed to flame.

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

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

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

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Remove all sources of ignition. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep away from heat, sparks and flame. Avoid ingestion and inhalation.

Storage: Keep away from heat and flame. Keep away from sources of ignition. Keep from contact with

Material Safety Data Sheets, Carver Hall RM 208-A

oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids.

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
Bismuth	none listed	none listed	none listed

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

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: silver- white or red

Odor: odorless

pH: Not available.

Vapor Pressure: 1 mm Hg @1021.1 deg C

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not available.

Boiling Point: 1420 deg C

Freezing/Melting Point:271.3 deg C

Decomposition Temperature:Not available.

Solubility: Insoluble in water.

Specific Gravity/Density:9.80

Molecular Formula:Bi

Molecular Weight:208.984

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

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

Conditions to Avoid: High temperatures, incompatible materials, ignition sources, strong oxidants.

Incompatibilities with Other Materials: Incompatible with aluminum and air, ammonium nitrate, chloric acid, chlorine, iodine pentafluoride, nitric acid, perchloric acid, nitrosyl fluoride, iodine pentafluoride and oxidizing agents.

Hazardous Decomposition Products: Bismuth oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-69-9: EB2600000

LD50/LC50:

CAS# 7440-69-9:

Oral, mouse: LD50 = 10 gm/kg;

Oral, rat: LD50 = 5000 mg/kg;

Carcinogenicity:

CAS# 7440-69-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-69-9 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 # 7440-69-9: 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# 7440-69-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

Material Safety Data Sheets, Carver Hall RM 208-A

California No 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# 7440-69-9: No information available.

Canada - DSL/NDSL

CAS# 7440-69-9 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.

Material Safety Data Sheet

Bleach

ACC# 91020

Section 1 - Chemical Product and Company Identification

MSDS Name: Bleach

Catalog Numbers: S72823

Synonyms:

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-52-9	Sodium hypochlorite	5.0	231-668-3
497-19-8	Sodium carbonate anhydrous	<1.0	207-838-8
7732-18-5	Water	Balance	231-791-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear pale yellow liquid.

Danger! Corrosive. Causes eye and skin burns. Causes digestive tract burns. Harmful if inhaled. Causes respiratory tract irritation. May cause methemoglobinemia.

Target Organs: Blood.

Potential Health Effects

Eye: May cause irreversible eye injury. Contact with liquid is corrosive to the eyes and causes severe burns.

Skin: Causes skin burns.

Ingestion: May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient

Material Safety Data Sheets, Carver Hall RM 208-A

oxygenation of the blood), convulsions, and death. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.

Inhalation: Harmful if inhaled. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause pulmonary edema and severe respiratory disturbances.

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

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure.

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. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated.

Extinguishing Media: Do NOT get water inside containers. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

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

Spills/Leaks: Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Provide ventilation.

Section 7 - Handling and Storage

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

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

Section 8 - Exposure Controls, Personal Protection

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium hypochlorite	none listed	none listed	none listed
Sodium carbonate anhydrous	none listed	none listed	none listed
Water	none listed	none listed	none listed

OSHA Vacated PELs: Sodium hypochlorite: No OSHA Vacated PELs are listed for this chemical. Sodium carbonate anhydrous: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash 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 respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear pale yellow

Odor: odor of hypochlorites

pH: Not available.

Vapor Pressure: 14 mm Hg

Vapor Density: 2.58

Evaporation Rate: >1.0

Viscosity: Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Boiling Point: 100 deg C

Freezing/Melting Point: 0 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 1.07

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, combustible materials.

Incompatibilities with Other Materials: Sodium hypochlorite is incompatible with amines, ammonia, ammonium acetate, ammonium carbonate, ammonium nitrate, ammonium oxalate, ammonium phosphate, cellulose, and ethyleneimine, strong acids, reducing agents, amines, and ammonia salts.

Hazardous Decomposition Products: Hydrogen chloride, chlorine, sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7681-52-9: NH3486300

CAS# 497-19-8: VZ4050000

CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 7681-52-9:

Draize test, rabbit, eye: 10 mg Moderate;

Draize test, rabbit, eye: 1.31 mg Mild;

Oral, mouse: LD50 = 5800 mg/kg;

CAS# 497-19-8:

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, eye: 50 mg Severe;

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

Inhalation, mouse: LC50 = 1200 mg/m³/2H;

Inhalation, rat: LC50 = 2300 mg/m³/2H;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, rat: LD50 = 4090 mg/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

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Carcinogenicity:

CAS# 7681-52-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 497-19-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

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

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

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:	HYPOCHLORITE SOLUTIONS	No information available.
Hazard Class:	8	
UN Number:	UN1791	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

Material Safety Data Sheets, Carver Hall RM 208-A

TSCA

CAS# 7681-52-9 is listed on the TSCA inventory.
CAS# 497-19-8 is listed on the TSCA inventory.
CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

CAS# 7681-52-9: 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 # 7681-52-9: immediate.
CAS # 497-19-8: immediate.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7681-52-9 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# 7681-52-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 497-19-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

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

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 31 Contact with acids liberates toxic gas.
R 34 Causes burns.

Safety Phrases:

S 28 After contact with skin, wash immediately with...
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 50 Do not mix with ... (to be specified by the manufacturer).
S 61 Avoid release to the environment. Refer to special instructions

Material Safety Data Sheets, Carver Hall RM 208-A

/safety data sheets.

WGK (Water Danger/Protection)

CAS# 7681-52-9: 2

CAS# 497-19-8: 1

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

Canada - DSL/NDSL

CAS# 7681-52-9 is listed on Canada's DSL List.

CAS# 497-19-8 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 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# 7681-52-9 is listed on the Canadian Ingredient Disclosure List.

CAS# 497-19-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Info

Material Safety Data Sheet

Boric acid

ACC# 03260

Section 1 - Chemical Product and Company Identification

MSDS Name: Boric acid

Catalog Numbers: AC180570000, AC180570010, AC180570025, AC217080000, AC217085000, AC315180000, AC315181000, AC327130000, AC327130010, AC423480000, 42348-0020, 42348-5000, A73-1, A73-10, A73-10LC, A73-3, A73-325LB, A73-50, A73-500, A7350LC, A74-1, A74-10, A74-3, A74-500, A74-500LC, A77-10, A77-NHL, A78-10, A78-500, A79-12, A79-212, BP168-1, BP168-500, NC9269806, NC9974905

Synonyms: Boracic acid; Hydrogen borate; Orthoboric 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
10043-35-3	Boric acid	99+	233-139-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! May impair fertility. Causes eye and skin irritation. May cause respiratory tract irritation.

Target Organs: Blood, kidneys, heart, central nervous system, liver, spleen, gastrointestinal system, eyes, reproductive system, 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 cause nausea and vomiting. May be harmful if

Material Safety Data Sheets, Carver Hall RM 208-A

swallowed. CNS effects (excitement or depression, lethargy, headache, coma, seizures), dehydration, arrhythmias, shock and metabolic acidosis have been reported in extreme adult and pediatric cases.

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

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. Repeated exposure may cause central nervous system damage. 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. May impair fertility.

Section 4 - First Aid Measures

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

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

Ingestion: Do not induce vomiting. Get medical aid.

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

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

Flash Point: Not 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. 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

Material Safety Data Sheets, Carver Hall RM 208-A

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
Boric acid	2 mg/m ³ TWA (inhalable fraction, listed under Borate compounds, inorganic); 6 mg/m ³ STEL (inhalable fraction, listed under Borate compounds, inorganic)	none listed	none listed

OSHA Vacated PELs: Boric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: 3.8 - 4.8 (33g/L aq.sol.)

Vapor Pressure: 2.7 mbar @ 20 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 169 deg C

Decomposition Temperature: 100 deg C

Solubility: 49.5 g/L @ 20°C

Material Safety Data Sheets, Carver Hall RM 208-A

Specific Gravity/Density: Not available.

Molecular Formula: H₃BO₃

Molecular Weight: 61.83

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: Caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), acetic anhydride, alkali carbonates, strong oxidizing agents.

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

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 10043-35-3: ED4550000; ED4560000

LD50/LC50:

CAS# 10043-35-3:

Oral, mouse: LD50 = 3450 mg/kg;

Oral, rat: LD50 = 2660 mg/kg;

Oral, rat: LD50 = 2500 mg/kg;

Carcinogenicity:

CAS# 10043-35-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: No information found
Mutation in microorganisms: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Water flea Daphnia: LC50 = 115.0-153.0 mg/L; 48 Hr.; Static Condition
Fish: Rainbow trout: LC50=150mg B/L; 24-day; Fish: Goldfish: LC50=46mg B/L; 7-day; Mosquito fish (fresh water) TLM=1800 ppm/24H
Mosquito fish (fresh water) TLM=1800 ppm/24H

Material Safety Data Sheets, Carver Hall RM 208-A

Environmental: Boric acid is a water-soluble white powder that may, at high concentrations, cause damage to trees or vegetation by root absorption.

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# 10043-35-3 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

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

Material Safety Data Sheets, Carver Hall RM 208-A

CAS # 10043-35-3: 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 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# 10043-35-3 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:

T

Risk Phrases:

R 60 May impair fertility.

Safety Phrases:

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

S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 10043-35-3: 1

Canada - DSL/NDSL

CAS# 10043-35-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of 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# 10043-35-3 is listed on the Canadian Ingredient Disclosure List.

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ALDRICH CHEMICAL CO INC -- 28914-0, CADMIUM CARBONATE, POWDER, CA 1 (SUPDAT) --
6810-00N056958

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

Product ID:28914-0, CADMIUM CARBONATE, POWDER, CA 1 (SUPDAT)
MSDS Date:05/02/1994
FSC:6810
NIIN:00N056958
MSDS Number: BWLZW
=== Responsible Party ===
Company Name:ALDRICH CHEMICAL CO INC
Address:1001 W ST PAUL AVE
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:CARBONIC ACID, CADMIUM SALT; (CADMIUM CARBONATE POWDER, CA
2 MICRON)
CAS:513-78-0
RTECS #:FF9320000
Fraction by Wt: 98%
OSHA PEL:N/K
ACGIH TLV:N/K

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

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO
Health Hazards Acute and Chronic:ACUTE:HARMFUL IF SWALLOWED, INHALED,
OR ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION.
Explanation of Carcinogenicity:CADMIUM CARBONATE:IARC MONO ON EVAL OF
CARCINOGENIC RISK OF CHEM TO MAN, VOL 58, PG 119, 1993:GROUP 1. NTP
7TH (SUPDAT)
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

First Aid:EYES/SKIN:IMMED FLUSH WITH COPIOUS AMTS OF WATER FOR @ LEAST
15 MINS WHILE REMOVING CONTAMINATED CLTHG & SHOES. INHAL:REMOVE TO

Material Safety Data Sheets, Carver Hall RM 208-A

FRESH AIR, IF NOT BRTHG GIVE ARTF RESP. IF BRTHG IS DFCLT, GIVE OXYGEN. INGEST:WASH OUT MOUTH W/WATER PROVIDED PERSON IS CONSCIOUS. CALL PHYSICIAN. WASH THORO AFTER HANDLING. DISCARD CONTAMD CLOTHING & SHOES.

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

Extinguishing Media:NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:THIS MATL, LIKE MOST MATLS IN POWDER FORM, IS CAPABLE OF CREATING DUST EXPLOSION. REACTS VIOLENTLY WITH POTASSIUM.

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

Spill Release Procedures:EVACUATE AREA. WEAR NIOSH/MSHA SCBA, RUBBER BOOTS & HEAVY RUBB GLOVES. SWEEP UP, PLACE IN BAG & HOLD FOR WASTE DISP. AVOID RAISING DUST. VENTILATE AREA & WASH SPILL SITE AFTER MATL PICKUP IS COMPLETE.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:TOXIC. HARMFUL. MAY CAUSE CANCER. HARMFUL BY INHAL, IN CONT W/SKIN & IF SWALLOWED. DANGER; CONTAINS CADMIUM. AVOID CREATING DUST.

Other Precautions:CAN CAUSE LUNG & KIDNEY DISEASE. IN CASE OF ACCIDENT/IF YOU FEEL UNWELL, SEEK MED ADVICE IMMED (SHOW LABEL WHERE POSS). TAKE OFF IMMED ALL CONTAMD CLTHG. WEAR SUITABLE PROT CLTHG, GLOVES & EYE/FACE PR OTECTION.

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

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .

Ventilation:CHEMICAL FUME HOOD.

Protective Gloves:CHEMICAL-RESISTANT GLOVES.

Eye Protection:ANSI APPRVD SAFETY GOGGLES .

Other Protective Equipment:OTHER PROTECTIVE CLOTHING.

Work Hygienic Practices:WASH THORO AFTER HANDLING.

Supplemental Safety and Health

MFG TRADE NAME/PART NO:MICRON, 98%. EXPLAN OF CARCIN:ANNUAL REPORT ON CARCIN, 1994:ANTIC TO BE CARCINOGEN. WASTE DISP METH:EXCESS SULFIDE W/SODIUM HYPOCHLORITE. NEUT SOLN BEFORE FLUSHING DOWN DRAIN. O BSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

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

Evaporation Rate & Reference:NOT KNOWN

Solubility in Water:NOT KNOWN

Appearance and Odor:WHITE POWDER

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

Stability Indicator/Materials to Avoid:YES
OXIDIZING AGENTS.

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Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:TOXIC FUMES.

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

Waste Disposal Methods:MATL SHOULD BE DISSOLVED IN 1)WATER; 2) ACID SOLN OR 3) OXIDIZED TO WATER-SOLUBLE STATE. PRECIPITATE MATL AS SULFIDE, ADJUSTING PH OF SOLN TO 7 TO COMPLETE PRECIPITATION. FILTER INSOLUBLES & DISPOSE O F THEM IN HAZ WASTE SITE. DESTROY ANY (SUPDAT)

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Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- CADMIUM SULFATE OCTAHYDRATE, C-19 -- 6810-00N036470

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

Product ID:CADMIUM SULFATE OCTAHYDRATE, C-19
MSDS Date:03/28/1991
FSC:6810
NIIN:00N036470
MSDS Number: BQQZK
=== 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:ING 7:COURSES. AFTER FIRST COURSE, SUBSEQUENT COURSES
SHOULD NOT EXCEED 50 MG/KG/DAY. DAILY URINALYSES SHOULD BE (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8:DONE DURING TREATMENT PERIOD. DOSAGE SHOULD BE
REDUCED IF ANY UNUSUAL URINARY FINDINGS APPEAR. FOR (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9:INTRAMUSCULAR ADMIN, GIVE 20% SOLN (200 MG/ML), 12.5
MG/KG BODY WT EVERY 4-6 HRS. DILUTE EACH DOSE W/AN (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10:EQUAL VOL OF 1% PROCAINE. DOSE LIMITATION IS SAME AS
THAT GIVEN ABOVE. ANTIDOTE SHOULD BE ADMIN BY (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11:QUALIFIED MED PERSONNEL.
RTECS #:9999999ZZ

Ingred Name:WASTE DISP METH:CONTACT THE DISTRICT DIRECTOR OF THE EPA.
RTECS #:9999999ZZ

Ingred Name:RESP PROT:MODE. SUPPLIED-AIR RESP W/FULL FACEPIECE OPERATED
IN PRESS-DEMAND OR OTHER POS PRESS MODE IN (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14:COMBINATION W/AN AUXILIARY SCBA OPERATED IN
PRESS-DEMAND OR OTHER POS PRESS MODE. ESCAPE:AIR-PURIFYING (ING 16)

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RTECS #:9999999Z

Ingred Name:ING 15:FULL FACEPIECE RESPIRATOR W/HIGH-EFFICIENCY PARTICULATE FILTER. ESCAPE-TYPE SCBA.

RTECS #:9999999Z

Ingred Name:CADMIUM SULFATE (1:1) HYDRATE (3:8); (CADMIUM SULFATE OCTAHYDRATE). PEL:0.1 MG(CD)/M3

CAS:7790-84-3

RTECS #:EV2850000

Fraction by Wt: 100%

OSHA PEL:SEE INGREDIENT NAME

ACGIH TLV:0.01 MG(CD)/M3

Ingred Name:FIRST AID PROC:NO CHEM REMAINS (15-20 MINS). GET MD IMMED. INGEST:GIVE MILK OR BEATEN EGGS EVERY 4 HRS TO (ING 3)

RTECS #:9999999Z

Ingred Name:ING 2:RELIEVE GI IRRIT. REMOVE UNABSORBED CADMIUM BY CATHARSIS W/FLEET'S PHOSPHO-SODA, 30-60 ML DILUTED 1:4 IN (ING 4)

RTECS #:9999999Z

Ingred Name:ING 3:WATER. TREATMENT MUST BE ADMIN BY MED PERS. ANTIDOTE: CADMIUM POISONING:DO NOT GIVE DIMERCAPROL (BAL). IF (ING 5)

RTECS #:9999999Z

Ingred Name:ING 4:SYMPS PERSIST, ADMIN OF CALCIUM DISODIUM EDETATE IS RECOM. GIVE 15-25 MG/KG (0.08-0.125 ML OF 20% SOLN PER (ING 6)

RTECS #:9999999Z

Ingred Name:ING 5:KILOGRAM OF BODY WT) IN 250-500 ML OF 5% DEXTROSE IV OVER 1-2 HR PERIOD, TWICE DAILY. MAX DOSE SHOULD NOT (ING 7)

RTECS #:9999999Z

Ingred Name:ING 6:EXCEED 50 MG/KG/DAY. THE DRUG SHOULD BE GIVEN IN 5-DAY COURSES W/A REST PERIOD OF AT LEAST 2 DAYS BETWEEN (ING 8)

RTECS #:9999999Z

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

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO

Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:YES

Health Hazards Acute and Chronic:ACUTE: INHAL:4-10 HRS AFTER INHALING FUMES/DUST OF CADMIUM CMPDS, TIGHTNESS IN CHEST/SUBSTERNAL PAIN, DYSPNEA & COUGH W/HEMOPTYSIS, FOLLOWED BY PNEUMONITIS & PULM EDEMA MAY OCCUR. IN SEV CASES, SYMPS MAY BE PROGRESSIVE, W/DEATH IN 7-10 DAYS. BLOOD DISORDERS & LIVER/RENAL DAM MAY OCCUR. HDCH, MUSCLE (EFTS OF OVEREXP)

Explanation of Carcinogenicity:CADMIUM SULFATE OCTAHYDRATE: GROUP 2A (IARC); ANTICIPATED TO BE A CARCINOGEN (NTP); OSHA REGULATED.

Effects of Overexposure:HLTH HAZ:ACHE, NAUS, VOM & DIARR ARE POSS. SKIN/EYES:MAY CAUSE IRRIT. INGEST:CADMIUM SALTS MAY CAUSE HDCH, MUSCLE ACHES, SALIVATION, NAUS, VOM, ABDOM PAIN, DIARR, LIVER/KIDNEY DAM & RENAL FAILURE. CHR ONIC: INHAL:RPTD/PRLNGD EXPOS TO CADMIUM CMPDS MAY CAUSE EMPHYSEMA, RENAL/LIVER DAM, ANEMIA, WEIGHT LOSS, (SUPP DATA)

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

First Aid:INHAL:REMOVE TO FRESH AIR IMMED. IF BRTHG HAS STOPPED,
PERFORM ARTF RESP. KEEP PERS WARM/AT REST. TREAT
SYMPTOMATICALLY/SUPPORTIVELY. GET MD IMMED. SKIN:REMOVE CONTAMD
CLTHG/SHOES IMMED. WASH AFFECTED AREA W/SOAP/MILD DETERGENT & LGE
AMTS OF WATER UNTIL NO CHEM REMAINS (15-20 MINS). GET MD IMMED.
EYES:WASH IMMED W/LGE AMTS OF WATER/NORM SALINE, OCCASNLY LIFTING
UPPER/LOWER LIDS, UNTIL (ING 2)

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

Extinguishing Media:DRY CHEM, CARBON DIOXIDE, WATER SPRAY OR REGULAR
FOAM. FOR LGR FIRES, USE WATER SPRAY, FOG OR REGULAR FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP
. MOVE CONTR FROM FIRE AREA IF YOU CAN W/OUT RISK. AVOID BRTHG
VAPORS/DUST. KEEP UPWIND.
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO
HEAT OR FLAME.

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

Spill Release Procedures:OCCUPATIONAL SPILL:STOP LEAK IF YOU CAN W/OUT
RISK. SMALL SPILL:TAKE UP W/SAND OR OTHER ABSORBENT MATERIAL &
PLACE INTO CLEAN, DRY CONTAINER FOR LATER DISPOSAL. KEEP
UNNECESSARY PEOPLE AWAY. ISOLATE H AZARD AREA & DENY ENTRY.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:AVOID CONTACT W/STRONG OXIDIZERS,
EXCESSIVE HEAT, SPARKS OR OPEN FLAME.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

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

Respiratory Protection:SPECIFIC RESP SELECTED MUST BE BASED ON CONTAM
LEVELS FOUND IN WORK PLACE, MUST NOT EXCEED WORKING LIMITS OF RESP
& BE APPRVD BY NIOSH/MSHA. AT ANY DETECTABLE CONC: SCBA W/FULL
FACEPIECE OPERATED IN P RESS-DEMAND OR OTHER POS PRESS (ING 14)
Ventilation:PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO
MEET PUBLISHED EXPOSURE LIMITS.
Protective Gloves:PROTECTIVE GLOVES.
Eye Protection:CHEM WORK GOG W/FULL LENGTH FSHLD
Other Protective Equipment:PROTECTIVE (IMPERVIOUS) CLOTHING & EQUIPMENT
TO PREVENT REPEATED/PROLONGED SKIN CONTACT W/THIS SUBSTANCE.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
EFTS OF OVEREXP:IRRITABILITY, ULCERATION OF NASAL SEPTUM, ANOSMIA &
DISCOLOR OF TEETH. SOME STUDIES INDICATE OCCUP EXPOS TO CADMIUM IN
SOME FORM INCR RISK OF PROSTATE, RESP & GENITOURINARY CANCERS. SK
IN:RPTD/PRLNGD EXPOS W/IRRITANTS MAY LEAD TO DERM. EYE:RPTD/PRLNGD
EXPOS W/IRRITANTS MAY CAUSE CONJ. INGEST:NO DATA.

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

HCC:T7

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Melt/Freeze Pt:M.P/F.P Text:107F,42C
Spec Gravity:3.1
Solubility in Water:SOLUBLE
Appearance and Odor:COLORLESS MONOCLINIC CRYSTALS; ODORLESS.

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

Stability Indicator/Materials to Avoid:YES
AVOID CONTACT W/STRONG OXIDIZERS.
Stability Condition to Avoid:MAY BURN BUT DOES NOT IGNITE READILY.
AVOID CONTACT W/EXCESSIVE HEAT, SPARKS OR OPEN FLAME.
Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS INCLUDE
TOXIC FUMES OF CADMIUM & SULFUR OXIDES.

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

Waste Disposal Methods:CADMIUM-REG LEVEL:1 MG/L. MATL WHICH CONT
SUBSTANCE AT/ABOVE REG LEVEL MEET EPA CHARACT OF TOX & MUST BE
DISPOSED OF I/A/W 40CFRPART262. EPA HAZ WASTE NO D006. OBSERVE ALL
FED, STATE & LOC REGS WHEN S TORING/DISPOSING OF SUBSTANCE. FOR
ASSIST, (ING 13)

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particular situation.

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Calcium

- Calcium, metal and alloys, pyrophoric
- Calcium alloys, pyrophoric

Formula	Ca
Structure	Ca
Description	Soft silver-white crystalline alkaline-earth metal.
Uses	As industrial catalyst for polyester fibers.

Registry Numbers and Inventories.

CAS	7440-70-2
NIH PubChem CID	5460341
EC (EINECS/ELINCS)	231-179-5
EC Index Number	020-001-00-X
EC Class	F; R15
RTECS	EW8040000
UN (DOT)	1401
Merck	13,1644
Beilstein/Gmelin	16277 (G)
Swiss Giftliste 1	G-6808
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	Ca
Formula mass	40.08
Melting point, °C	850
Boiling point, °C	1484
Vapor density (air=1)	1.4
Density	1.54 g/cm ³

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Solubility in water	Decomposes
Thermal expansion	2.1E-05/K
Heat of fusion	12.4 kJ/mol

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Do not expose to air. Store protected from moisture. Store under an inert atmosphere.
Handling	Wash thoroughly after handling. Use only in a well ventilated area. Do not allow water to get into the container because of violent reaction. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Handle under an inert atmosphere. Store protected from air. 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: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Do not expose spill to water. Place under an inert atmosphere.
Disposal code	26
Stability	Combines vigorously or explosively with water. May ignite spontaneously if exposed to air or kept in the presence of moisture.
Incompatibilities	Acids, oxidizing agents, carbonates, dinitrogen tetroxide, halogens, sulfur, chlorine, chlorine trifluoride, fluorine, air, moisture, water, water and mixtures containing water (e.g. aqueous solutions, water).
Decomposition	Irritating and toxic fumes and gases, hydrogen gas, calcium oxide, calcium hydroxide.

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. Water Reactive. Material will react with water and may release a flammable and/or toxic gas. This chemical poses an explosion hazard. Reacts with water to form explosive hydrogen gas. May ignite or explode on contact with steam or moist air. May re-ignite after fire is extinguished. Extinguishing media: Do NOT get water inside containers. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. DO NOT USE WATER OR FOAM. For small fires use dry chemical, soda ash, lime or sand. For large fires use dry sand, dry chemical, soda ash or lime or withdraw from area and let fire burn.
Fire potential	Flammable/combustible material.
Hazards	Produce flammable gases on contact with water. May ignite on contact with water or moist air. Some react vigorously or explosively on contact with water. May be ignited by heat, sparks or

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flames. May re-ignite after fire is extinguished. Some are transported in highly flammable liquids. Runoff may create fire or explosion hazard.

Combustion products Fumes from burning calcium are highly irritating to skin, eyes and mucous membranes.

NEPA	Health	3
	Flammability	1
	Reactivity	2
	Special	W

Health.

Poison_Class 2

Exposure effects Chronic ingestion of calcium carbonate may cause irritability, lethargy, stupor, and coma, depending on the amount and duration of ingestion. These symptoms are secondary to hypercalcemia, alkalosis, and renal impairment. Chronic ingestion of calcium carbonate in doses 4 to 60 g/day for 2 to 30 days has resulted in these symptoms; however, at doses less than 10 g/day, pre-existing factors such as renal dysfunction, concurrent thiazide therapy, volume depletion, or hyperparathyroidism were usually present in patients developing these sequelae.

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

Inhalation May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. May cause severe respiratory tract irritation and possible burns.

Skin Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Eyes Causes eye irritation and possible burns.

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.

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

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

Eyes 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 or keep eyes closed.

Transportation.

UN number 1401

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Hazard class	4.3
Packing Group	II
USCG CHRIS Code	CAM
HS Code	2805 12 00
Std. Transport #	4916171

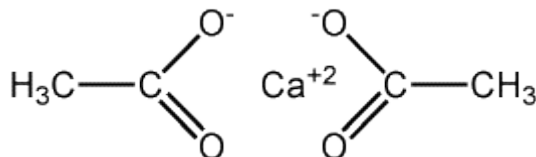
Calcium acetate

- Calcium di(acetate)
- Brown acetate of lime
- Calcium diacetate
- Gray acetate
- Gray acetate of lime
- Lime acetate

Formula



Structure



Description

Colorless crystals or white powder. Slight odor of acetic acid.

Uses

In manufacture of acetic acid, acetone, in dyeing, tanning & curing skins, in lubricants, as food stabilizer, as corrosion inhibitor.

Registry Numbers and Inventories.

CAS	62-54-4
NIH PubChem CID	6116
EC (EINECS/ELINCS)	200-540-9
RTECS	AF7525000
RTECS class	Mutagen
Merck	12,1683
Beilstein/Gmelin	44753 (G)
FEMA	2228
Swiss Giftliste 1	G-4717
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	C ₄ H ₈ CaO ₅
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Formula mass	158.17
Melting point, °C	160 (decomposes)
Decomposition point, °C	160
Vapor density (air=1)	5.5
Density	1.509 g/cm ³
Solubility in water	250 g/L

Hazards and Protection.

Storage	Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.
Handling	Wash thoroughly after handling. Wash hands before eating. Use with adequate ventilation. 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: 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 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Flush down the spill with a large amount of water. Provide ventilation. Do not get water inside containers.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents and moisture.
Decomposition	Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, calcium oxide, acetone.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.
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Health.

Poison_Class	5
Exposure effects	Chronic ingestion of calcium carbonate may cause irritability, lethargy, stupor, and coma, depending on the amount and duration of ingestion. These symptoms are secondary to hypercalcemia, alkalosis, and renal impairment.
Ingestion	Ingestion of large amounts may cause gastrointestinal irritation.
Inhalation	May cause respiratory tract irritation.
Skin	May cause skin irritation.

Material Safety Data Sheets, Carver Hall RM 208-A

Eyes May cause eye irritation.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid 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 Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

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

Material Safety Data Sheets, Carver Hall RM 208-A

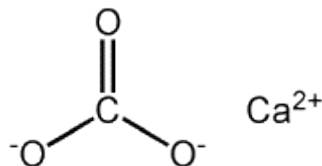
Calcium carbonate

- Calcite
- Limestone
- Marble
- Chalk

Formula

CaCO₃

Structure



Description

White powder. Odorless.

Uses

Used to produce viscous solutions or dispersions, to impart body, improve consistency, or stabilize emulsions, including suspending and bodying agents, setting agents, jellying agents, and bulking agents. Stabilizers and thickeners, from table.

Registry Numbers and Inventories.

CAS	471-34-1
NIH PubChem CID	10112
EC (EINECS/ELINCS)	207-439-9
EC Class	S: 22 24/25
RTECS	FF9335000
RTECS class	Primary Irritant
Merck	13,1658
Beilstein/Gmelin	8544 (G)
EPA OPP	73502
Swiss Giftliste 1	G-7458
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 CCaO3

Material Safety Data Sheets, Carver Hall RM 208-A

Formula mass	100.09
Melting point, °C	825
Density	2.93 g/cm ³
Solubility in water	Insoluble
Heat of fusion	53.2 kJ/mol

Hazards and Protection.

Storage	Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids.
Handling	Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.
Disposal code	14
Stability	Stable under normal shipping and handling conditions.
Incompatibilities	Will ignite on contact with fluorine; incompatible with acids, alum, ammonium salts and mercury + hydrogen.
Decomposition	Calcium oxide.

Fire.

Flash Point, °C	825
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

NFPA	Health	1
	Flammability	0
	Reactivity	0

Health.

Poison_Class	-
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Material Safety Data Sheets, Carver Hall RM 208-A

Exposure effects	Chronic ingestion may cause hypercalcemia, alkalosis, and kidney damage. May also produce milk-alkali syndrome characterized by neurological symptoms such as irritability, lethargy, stupor, and coma.
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.
Skin	Causes skin irritation. Chronic ingestion may cause hypercalcemia, alkalosis, and kidney damage. May also produce milk-alkali syndrome characterized by neurological symptoms such as irritability, lethargy, stupor, and coma.
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.
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	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	CSR
USCG Compatability Group	34 Esters
HS Code	2836 50 00
IMO Chemical Code	18
IMO Pollution Category	III

Material Safety Data Sheets, Carver Hall RM 208-A

Calcium chloride

- Hydrophilite
- Calcosan
- Dowflake
- Liquidow

Formula	CaCl ₂
Structure	Ca^{2+} $\text{Cl}^- \quad \text{Cl}^-$
Description	White, crystalline solid. Odorless. Solutions are clear to light yellow. Hygroscopic or deliquescent.
Uses	Pavement deicer.

Registry Numbers and Inventories.

CAS	10043-52-4
NIH PubChem CID	24854
EC (EINECS/ELINCS)	233-140-8
EC Index Number	017-013-00-2
EC Class	Xi; R36
RTECS	EV9800000
RTECS class	Tumorigen; Mutagen; Human Data
Merck	13,1660
Beilstein/Gmelin	17127 (G)
EPA OPP	75605
Swiss Giftliste 1	G-4896
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	CaCl ₂
Formula mass	110.99
Melting point, °C	772

Material Safety Data Sheets, Carver Hall RM 208-A

Boiling point, °C	1600
Density	2.174 g/cm ³
Solubility in water	745 g/L
Thermal expansion	0.0000227/K
Heat of fusion	26.31 kJ/mol
Heat of vaporization	235 kJ/mol

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.
<u>WHMIS</u>	D2B
Handling	Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Wash clothing before reuse.
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 impervious gloves. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.
Disposal code	14
Stability	Stable under normal shipping and handling conditions.
Incompatibilities	Moisture.
Decomposition	Chlorine.

Fire.

Fire fighting	Fire control: Use water, dry chemical, carbon dioxide or foam to extinguish. Do not extinguish fire unless release can be stopped. Cool fire-exposed containers with water.
Fire potential	Nonflammable.
<u>NFPA</u>	Health 2
	Flammability 0
	Reactivity 0

Health.

Poison_Class	-
Exposure effects	Effects may be delayed.

Material Safety Data Sheets, Carver Hall RM 208-A

Ingestion	May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause cardiac disturbances. May be harmful if swallowed. In very severe cases, seizures, rapid respiration, slow heartbeat, or death, may
Inhalation	May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation.
Skin	Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.
Eyes	Contact with eyes may cause severe irritation, and possible eye burns.

First aid

Ingestion	Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation	Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration.
Skin	Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Eyes	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

CLC

HS Code

2827 20 00

Material Safety Data Sheets, Carver Hall RM 208-A

Calcium fluoride

- Calcium difluoride
- Fluorite
- Fluorspar

Formula	CaF ₂
Structure	$\begin{array}{c} \text{Ca}^{2+} \\ \text{F}^- \quad \quad \text{F}^- \end{array}$
Description	Odorless gray powder or granules.
Uses	Main primary source of fluorine & its compd, in ferrous metallurgy as flux to incr fluidity of slag, synthetic fluorspar is used in optical industry (transmits uv rays), pure form used as catalyst in dehydration & dehydrogenations, used to fluoridate drinking water.

Registry Numbers and Inventories.

CAS	7789-75-5
NIH PubChem CID	84512
EC (EINECS/ELINCS)	232-188-7
EC Class	S: 22 24/25
RTECS	EW1760000
RTECS class	Mutagen; Reproductive Effector
Merck	13,1669
Beilstein/Gmelin	18380 (G)
Swiss Giftliste 1	G-1988
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	CaF ₂
Formula mass	78.08
Melting point, °C	1418
Boiling point, °C	2500

Material Safety Data Sheets, Carver Hall RM 208-A

Vapor pressure, mm _{Hg}	16 (1910 C)
Density	3.18 g/cm ³
Solubility in water	1.6 mg/L (18 C)
Refractive index	1.4328
Heat of fusion	29.8 kJ/mol
Heat of vaporization	336.1 kJ/mol

Hazards and Protection.

Storage	Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.
Handling	Wash thoroughly after handling. Wash hands before eating. 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.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Reacts with hot concentrated sulfuric acid to liberate hydrogen fluoride.
Decomposition	Irritating and toxic fumes and gases, fluoride 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 extinguishing media appropriate to the surrounding fire. Substance is noncombustible. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Fire potential	Nonflammable.
NFPA	
Health	3
Flammability	0
Reactivity	0

Health.

Exposure limit(s)	TLV (as fluoride): 2.5 mg/m ³ A4 (as TWA) (ACGIH 1998)
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Material Safety Data Sheets, Carver Hall RM 208-A

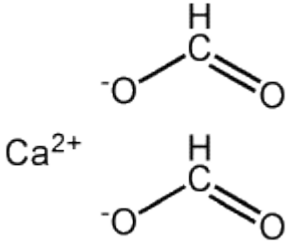
Poison_Class	5
Exposure effects	Prolonged or repeated exposure may cause permanent bone structure abnormalities. May cause kidney injury. Chronic inhalation may cause lung damage, bronchitis, and silicosis. May decrease blood clotting. Chronic exposure to fluoride compounds may cause systemic toxicity.
Ingestion	May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts of fluoride may include salivation, nausea, vomiting, abdominal pain, fever, labored breathing. Exposure to fluoride compounds can result in systemic toxic effects on the heart, liver, and kidneys. It may also deplete calcium levels in the body leading to hypocalcemia and death. May cause bone structure abnormalities.
Inhalation	Causes respiratory tract irritation. May cause heart disturbances, possibly leading to cardiac arrest and death. May cause hyperactive reflexes and muscular spasms. May cause respiratory arrest.
Skin	Causes skin irritation. Chronic inhalation may cause lung damage, bronchitis, and silicosis. May decrease blood clotting.
Eyes	Causes eye irritation.
First aid	
Ingestion	Induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation	Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Skin	Get medical aid immediately. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Eyes	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	CAF
HS Code	2826 19 00

Calcium formate

- Calcium diformate
- Calcoform

Formula	$C_2H_2CaO_4$
Structure	
Description	Orthorhombic crystals.
Uses	Food preservative.

Registry Numbers and Inventories.

CAS	544-17-2
NIH PubChem CID	10997
EC (EINECS/ELINCS)	208-863-7
RTECS	LQ5600000
RTECS class	Primary Irritant
Merck	12,1711
Beilstein/Gmelin	37258 (G)
Swiss Giftliste 1	G-7496
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	$C_2H_2CaO_4$
Formula mass	130.11
Melting point, °C	300
Density	2.009 g/cm ³

Material Safety Data Sheets, Carver Hall RM 208-A

Solubility in water 166 g/L (20 C)

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry area away from incompatible substances.
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.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up, then place into a suitable container for disposal. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents.
Decomposition	Carbon monoxide, carbon dioxide.

Fire.

Fire fighting Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. To extinguish fire, use carbon dioxide, dry chemical powder or appropriate foam.

NFPA	Health	1
	Flammability	0
	Reactivity	0

Health.

Poison_Class	4
Exposure effects	Effects may be delayed.
Ingestion	May cause gastrointestinal irritation with nausea, vomiting and diarrhea.
Inhalation	Aspiration may lead to pulmonary edema. Causes irritation of the mucous membrane and upper respiratory tract.
Skin	Causes skin irritation.
Eyes	Causes moderate eye irritation. May cause chemical conjunctivitis.

First aid

Material Safety Data Sheets, Carver Hall RM 208-A

Ingestion	Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation	Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Skin	Get medical aid immediately. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Material Safety Data Sheets, Carver Hall RM 208-A

Calcium hydroxide

- Calcium dihydroxide
- Calcium hydrate
- Hydrated lime
- Slaked lime

Formula	Ca(OH) ₂
Structure	$\begin{array}{c} \text{Ca}^{2+} \\ \text{OH}^- \quad \text{OH}^- \end{array}$
Description	White crystals or soft powder or granules, impure material has gray or buff color, odorless, readily absorbs carbon dioxide from the air to form calcium carbonate.
Uses	In lubricants, drilling fluid, pesticides, fireproofing coatings, water paint, as egg preservative, manufacture of paper pulp, in sbr rubber vulcanization, dehairing hides, in water treatment, in mortar, plaster, cement and other binding and paving materials.

Registry Numbers and Inventories.

CAS	1305-62-0
NIH PubChem CID	14777
EC (EINECS/ELINCS)	215-137-3
EC Class	Xi, R: 34, S: 26-36/37/39-45
RTECS	EW2800000
RTECS class	Agricultural Chemical and Pesticide; Mutagen; Primary Irritant
UN (DOT)	1759
Merck	13,1675
Beilstein/Gmelin	8815
EPA OPP	75601
Swiss Giftliste 1	G-1012
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	CaH2O2
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Material Safety Data Sheets, Carver Hall RM 208-A

Formula mass	74.10
Melting point, °C	550
Vapor density (air=1)	2.6
Odor threshold	Odorless
Density	2.24 g/cm ³
Solubility in water	0.18 g /100 ml
Refractive index	1.555
Thermal expansion	3.14E5/K (25 C)

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Do not exceed 25-30C.
<u>WHMIS</u>	E.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Use only in a chemical fume hood.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions.
Disposal code	14
Stability	Stable at room temperature in closed containers under normal storage and handling conditions. Readily absorbs carbon dioxide from air forming calcium carbonate.
Incompatibilities	Phosphorus, maleic anhydride, nitromethane, nitroethane, nitroparaffins, nitropropane, polychlorinated phenols + potassium nitrate.
Decomposition	Calcium oxide, forms chlorinated benzodioxins when mixed with polychlorinated phenols and potassium nitrate.

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. Substance is nonflammable. Runoff from fire control or dilution water may cause pollution. Extinguishing media: Use dry chemical.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Contact with metals may evolve flammable hydrogen gas.

Material Safety Data Sheets, Carver Hall RM 208-A

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

NFPA	Health	3
	Flammability	0
	Reactivity	0

Health.

Exposure limit(s)	TLV: 5 ppm; mg/m ³ (ACGIH 1996). OSHA PEL: TWA 15 mg/m ³ (total) 5 mg/m ³ (resp) NIOSH REL: TWA 5 mg/m ³
Poison_Class	4
Exposure effects	Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Prolonged or repeated exposure may cause corneal damage and the development of cataracts and glaucoma.
Ingestion	Causes gastrointestinal tract burns. May cause circulatory system failure. May cause perforation of the digestive tract. Causes severe pain, nausea, vomiting, diarrhea, and shock. Effects may be delayed.
Inhalation	Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Inhalation may produce burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Causes irritation of the mucous membrane and upper respiratory tract.
Skin	Causes severe skin irritation and burns. May be harmful if absorbed through the skin.
Eyes	May result in corneal injury. Contact with liquid or vapor causes severe burns and possible irreversible eye damage. May cause temporary corneal clouding.
First aid	
Ingestion	Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation	Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do not use mouth-to-mouth respiration if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Skin	Get medical aid immediately. Wash clothing before reuse. Rinse area with large amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

Transportation.

UN number	1759
Response guide	154



Material Safety Data Sheets, Carver Hall RM 208-A

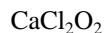
Hazard class	8
Packing Group	I; II; III
USCG CHRIS Code	CAH
<u>USCG Compatatibility Group</u>	5 Caustics
HS Code	2825 90 19
IMO Chemical Code	18
IMO Pollution Category	D

Material Safety Data Sheets, Carver Hall RM 208-A

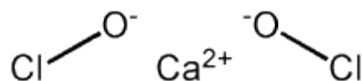
Calcium hypochlorite, dry

- Calcium hypochlorite mixture, dry, with more than 39% available Chlorine (8.8% available Oxygen)
- Chlorinated lime
- Losantin
- Pittchlor
- Calcium dihypochlorite

Formula



Structure



Description

White powder or flat plates. Strong chlorine odor.

Uses

Algicide, bactericide, deodorant, fungicide, in sugar refining, oxidizing agent, bleaching agent, disinfectant.

Registry Numbers and Inventories.

CAS	7778-54-3
NIH PubChem CID	24504
EC (EINECS/ELINCS)	231-908-7
EC Index Number	017-012-00-7
EC Class	O; R8 , Xn; R22, R31, C; R34, N; R50
RTECS	NH3485000
RTECS class	Agricultural Chemical and Pesticide; Tumorigen; Mutagen; Human Data
UN (DOT)	1748
Merck	13,2111
Beilstein/Gmelin	120905 (G)
EPA OPP	14701
Swiss Giftliste 1	G-54974
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.

Material Safety Data Sheets, Carver Hall RM 208-A

Formula	CaCl ₂ O ₂
Formula mass	142.98
Melting point, °C	100
Density	2.35 g/cm ³
Solubility in water	Slightly soluble

Hazards and Protection.

Storage	Keep away from heat, sparks, and flame. Keep away from sources of ignition. Do not store near combustible materials. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Discard contaminated shoes.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not get water inside containers. Do not use combustible materials such as paper towels to clean up spill.
Stability	Stable at room temperature in closed containers under normal storage and handling conditions.
Incompatibilities	Reducing agents, carbontetrachloride, ammonia, aliphatic amines, aromatic amines, sulfur, sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), metal oxides, glycerol, phenols, diethylene glycol monomethyl ether, carbon, acetic acid + potassium, cyanides (e.g. potassium cyanide, sodium cyanide), ammonium chloride, charcoal, N,N-dichloromethylamine + heat, ethanol, menthol, iron oxide, rust, 1-propanethiol, isobutanethiol, turpentine, sodium hydrogen sulfate + starch + sodium carbonate, acetylene, hydroxy compounds (e.g. ethanol, ethylene glycol, glycerol, sugar), combustible materials (e.g. anthracene, grease, oil, mercaptans, methyl carbitol, nitromethane, organic matter, and propylmercaptan).
Decomposition	Hydrogen chloride, irritating and toxic fumes and gases, oxygen, chlorine.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with combustible materials may cause a fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Use water with caution and in flooding amounts. Contaminating or mixing with foreign materials such as combustibles, grease, and fuels can cause fire. Containers may explode when heated. Extinguishing media: Use water
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Material Safety Data Sheets, Carver Hall RM 208-A

spray to cool fire-exposed containers. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For small fires DO NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires, flood fire area with water from a distance.

Fire potential Slightly flammable. But evolves chlorine and at higher temperatures, oxygen.

Hazards Poisonous gases may be produced when heated

Combustion products Poisonous gases may be produced when heated.

NFPA	Health	3
	Flammability	0
	Reactivity	1
	Special	0

Health.

Poison_Class 3

Exposure effects Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects.

Ingestion May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. May be harmful if swallowed.

Inhalation Causes chemical burns to the respiratory tract. Aspiration may lead to pulmonary edema. May cause systemic effects. Causes corrosive action on the mucous membranes.

Skin Causes severe burns with delayed tissue destruction.

Eyes Causes eye burns. May result in corneal injury. May cause blepharitis (inflammation of the margins of the eyelids).

First aid

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

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

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

Eyes Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation is required (at least 30 minutes).

Transportation.

UN number 1748

Response guide [140](#)



Material Safety Data Sheets, Carver Hall RM 208-A

Hazard class	5.1
Packing Group	II
USCG CHRIS Code	CHY
<u>USCG Compatatibility Group</u>	5 Caustics
Std. Transport #	4918715
IMO Chemical Code	17
IMO Pollution Category	B (C)

Material Safety Data Sheets, Carver Hall RM 208-A

Barium oxide solid soln. with calcium oxide, magnesium oxide, phosphorus oxide, strontium oxide and zinc oxide, cerium and manganese-doped

Formula Unspecified

Registry Numbers and Inventories.

CAS	101356-94-9
NIH PubChem CID	3805637 (SID)
EC (EINECS/ELINCS)	309-890-8
UN (DOT)	1564
Beilstein/Gmelin	NA
Korea ECL	Listed

Properties.

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	ELIMINATE all ignition sources. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT GET WATER INSIDE CONTAINERS.
Stability	No data.

Fire.

Fire fighting	Extinguish using agent most appropriate for surrounding fire.
Fire potential	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Hazards	Contact with metals may evolve flammable hydrogen gas.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Material Safety Data Sheets, Carver Hall RM 208-A

Exposure effects

Ingestion	See Inhalation.
Inhalation	TOXIC; inhalation, ingestion, or skin contact with material may cause severe injury or death. Effects of contact or inhalation may be delayed.
Skin	Contact with molten substance may cause severe burns to skin and eyes. See Inhalation.
Eyes	See Inhalation.

First aid

Ingestion	Seek medical assistance.
Inhalation	Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.
Skin	Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.
Eyes	Immediately flush with running water for at least 20 minutes.

Transportation.

UN number	1564
Response guide	154
Hazard class	6.1
Packing Group	II; III



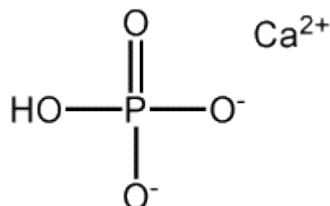
Calcium hydrogen phosphate

- Calcium acid phosphate
- Calcium dibasic phosphate
- Calcium hydrogen orthophosphate
- Calcium monohydrogen phosphate
- Calcium phosphate (1:1)
- Calcium phosphate

Formula

CaHPO₄

Structure



Description

White crystals or crystalline powder.

Uses

Control acidity in powdered drink mixes, ingredient in effervescent tablets, as a plastics stabilizer, and in ceramics. Its single largest application is as a leavening agent in bread, cake mixes, and self-rising flour.

Registry Numbers and Inventories.

CAS	7757-93-9
NIH PubChem CID	24441
EC (EINECS/ELINCS)	231-826-1
Merck	12,1739
Beilstein/Gmelin	10909 (G)
Swiss Giftliste 1	G-7156
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	CaHO4P
Formula mass	136.06
Melting point, °C	370

Material Safety Data Sheets, Carver Hall RM 208-A

Decomposition point, °C	230
Density	2.89 g/cm ³ (20 C)
Solubility in water	0.1 g/L

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
<u>WHMIS</u>	Insufficient information.
Handling	Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents.
Decomposition	Oxides of phosphorus, irritating and toxic fumes and gases, calcium oxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. To extinguish fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire.
Fire potential	Nonflammable.
<u>NFPA</u>	
Health	2
Flammability	0
Reactivity	0

Health.

Poison_Class	-
Exposure effects	
Ingestion	Causes gastrointestinal irritation with nausea, vomiting and diarrhea.
Inhalation	Dust is irritating to the respiratory tract.

Material Safety Data Sheets, Carver Hall RM 208-A

Skin Causes skin irritation.
Eyes Causes eye irritation. May result in corneal injury.

First aid

Ingestion Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Skin 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.

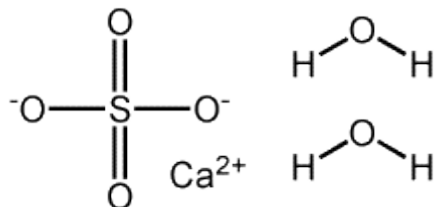
HS Code 2835 25 10

Calcium sulfate dihydrate

- Phosphogypsum
- Compactrol
- Landplaster

Formula CaSO₄·2H₂O

Structure



Description

White or nearly white, odorless crystals. Some forms of calcium sulfate have a fibrous appearance.

Uses

Used to make portland cement, plaster of paris and artificial marble; used in agriculture as a soil conditioner; used as a white pigment, filler or glaze in paints, enamels, pharmaceuticals, paper, insecticide dusts, yeast manufacture and polishing powders; in manufacture of sulfuric acid, calcium carbide and ammonium sulfate.

Registry Numbers and Inventories.

CAS	10101-41-4
NIH PubChem CID	24928
EC (EINECS/ELINCS)	600-148-1
EC Class	S: 22 24/25
RTECS	EW4150000
RTECS class	Agricultural Chemical and Pesticide
Merck	13,1711
Beilstein/Gmelin	7487 (G)
EPA OPP	203
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Philippiens PICCS	Listed

Properties.

Formula	CaH ₄ O ₆ S
Formula mass	172.17
Melting point, °C	150 (decomposes)
Density	2.32 g/cm ³ (20 C)

Material Safety Data Sheets, Carver Hall RM 208-A

Solubility in water	Slightly soluble
Refractive index	1.5248
Dielectric constant	4,98 (25 C)

Hazards and Protection.

Storage	Store in a cool, dry place. Keep container closed when not in use.
<u>WHMIS</u>	Does not meet criteria
Handling	Wash thoroughly after handling. Wash hands before eating. Use only in a well ventilated area. Avoid contact with skin and eyes. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to 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. Reduce airborne dust and prevent scattering by moistening with water. Clean up spills immediately, using the appropriate protective equipment.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents and moisture.
Decomposition	Oxides of sulfur, irritating and toxic fumes and gases, calcium oxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
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Health.

Poison_Class	F (Not subject to toxicity classification)
Exposure effects	May cause cancer according to animal studies. Repeated inhalation may cause nasal and tracheal inflammation. Chronic inhalation may lead to decreased pulmonary function.
Ingestion	Ingestion of large amounts may cause gastrointestinal irritation.
Inhalation	Causes respiratory tract irritation.
Skin	May cause skin irritation.
Eyes	May cause eye irritation.
First aid	
Ingestion	If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation	Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Skin	Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

HS Code 2833 29 90

Material Safety Data Sheet
Carborundum

ACC# 20700

Section 1 - Chemical Product and Company Identification

MSDS Name: Carborundum

Catalog Numbers: C192-500

Synonyms: Silicon Carbide.

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
409-21-2	SILICON CARBIDE	100.0	206-991-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to black solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause lung damage. May cause cancer based on animal studies.

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: Dust is irritating to the respiratory tract. May cause lung damage. Contains crystalline silica which may lead to respiratory abnormalities and silicosis.

Chronic: Chronic inhalation of dust may lead to silicosis. May cause lung damage. May cause silicosis-

Material Safety Data Sheets, Carver Hall RM 208-A

disabling pulmonary fibrosis characterized by fibrotic changes and miliary nodules in the lungs, dry cough, shortness of breath, emphysema, decreased chest expansion and increased susceptibility to tuberculosis.

Section 4 - First Aid Measures

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

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

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. Use extinguishing media appropriate to the surrounding fire. Dousing metallic fires with water may generate hydrogen gas, an extremely dangerous explosion hazard.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a dry area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
SILICON CARBIDE	10 mg/m ³ TWA (nonfibrous, inhalable fraction, particulate matter containing no asbestos and <1% crystalline silica); 3 mg/m ³ TWA (nonfibrous, respirable fraction, particulate matter containing no asbestos and <1% crystalline silica); 0.1 fiber/cm ³ TWA (respirable fibers, including	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: SILICON CARBIDE: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear safety goggles approved for the handling of explosive materials.

Skin: Wear appropriate gloves to prevent skin exposure.

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

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

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to black

Odor: none reported

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Material Safety Data Sheets, Carver Hall RM 208-A

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: 2700 deg C

Decomposition Temperature: Not available.

Solubility: insoluble in water

Specific Gravity/Density: 3.2

Molecular Formula: SiC

Molecular Weight: 40.0855

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: None reported.

Hazardous Decomposition Products: Oxides of silicon.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 409-21-2: VW0450000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 409-21-2:

- **ACGIH:** A2 - Suspected Human Carcinogen (fibrous, including whiskers)
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: An examination of 53 silicon carbide crushers showed 15 cases of pneumoconiosis in workers employed on the crushing, sieving and packing of silicon carbide have been reported.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Material Safety Data Sheets, Carver Hall RM 208-A

Ecotoxicity: No data available. No information reported.

Environmental: No information reported.

Physical: No information reported.

Other: None

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 409-21-2 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Material Safety Data Sheets, Carver Hall RM 208-A

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# 409-21-2 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 409-21-2: No information available.

Canada - DSL/NDSL

CAS# 409-21-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

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

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Celite 545

ACC# 02895

Section 1 - Chemical Product and Company Identification

MSDS Name: Celite 545

Catalog Numbers: AC349670000, AC349670025, AC349675000

Synonyms: Calcinated diatomaceous earthDiatomite

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
68855-54-9	Kieselguhr, soda ash flux-calcined	100	272-489-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available.

Target Organs: Lungs.

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: Harmful if inhaled. May cause respiratory tract irritation.

Chronic: Possible risk of irreversible effects.

Section 4 - First Aid Measures

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

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

Ingestion: 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.

Material Safety Data Sheets, Carver Hall RM 208-A

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: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe 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
Kieselguhr, soda ash flux-calcined	none listed	none listed	none listed

OSHA Vacated PELs: Kieselguhr, soda ash flux-calcined: No OSHA Vacated PELs are listed for this chemical.

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

Section 9 - Physical and Chemical Properties

Physical State: Powder
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Negligible.
Specific Gravity/Density: Not available.
Molecular Formula: O₂Si
Molecular Weight: 60.08

Section 10 - Stability and Reactivity

Chemical Stability: Stable.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong acids, hydrogen fluoride.
Hazardous Decomposition Products: None.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 68855-54-9 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 68855-54-9: 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:

Material Safety Data Sheets, Carver Hall RM 208-A

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# 68855-54-9 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

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

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

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

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

OSHA:

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

STATE

CAS# 68855-54-9 can be found on the following state right to know lists: Pennsylvania.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 40 Limited evidence of a carcinogenic effect.

R 20 Harmful by inhalation.

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# 68855-54-9: No information available.

Canada - DSL/NDSL

CAS# 68855-54-9 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# 68855-54-9 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheets, Carver Hall RM 208-A

ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH -- 22175-9 AMMONIUM CERIUM(IV)SULFATE -
- 6810-00F025682

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

Product ID:22175-9 AMMONIUM CERIUM(IV) SULFATE
MSDS Date:01/08/1991
FSC:6810
NIIN:00F025682
MSDS Number: BPSNJ
=== Responsible Party ===
Company Name:ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH
Address:1001 W ST PAUL AVE
Box:355
City:MILWAUKEE
State:WI
ZIP:53201
Country:US
Info Phone Num:414-273-3850 FAX: 414-273-4979
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:AMMONIUM CERIUM SULFATE
92/3
CAS:13840-04-5

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

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHALATION: HARMFUL, MUCOUS MEMBRANES
& UPPER RESPIRATORY TRACT IRRITATION. INGESTION: HARMFUL. SKIN:
HARMFUL ABSORPTION & IRRITATION. EYES: IRRITATION.
Explanation of Carcinogenicity:NONE

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

First Aid:EYES: WASH W/WATER FOR AT LEAST 15 MINS. SKIN: WASH W/SOAP &
WATER FOR AT LEAST 15 MINS. INHALATION: REMOVE TO FRESH AIR. IF NOT
BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT,
GIVE OXYGEN. INGESTION: WASH OUT MOUTH W/WATER PROVIDED PERSON IS
CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

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

Extinguishing Media:WATER SPRAY, CO2, DRY CHEMICAL POWDER. ALCOHOL OR
POLYMER FOAM.

Material Safety Data Sheets, Carver Hall RM 208-A

Fire Fighting Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS & PROTECTIVE CLOTHING TO PREVENT CONTACT W/SKIN/EYES.
Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITION. CONTACT W/OTHER MATERIAL MAY CAUSE FIRE.

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

Spill Release Procedures:WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS & HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG & HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA & WASH SPILL SITE AFTER MATERIAL PI CKUP IS COCOPLETE.

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

Handling and Storage Precautions:KEEP TIGHTLY CLOSED. STORE IN A COOL DRY PLACE. KEEP AWAY FROM COMBUSTIBLE MATERIALS, HEAT, SPARKS, & OPEN FLAMES.
Other Precautions:DON'T BREATH DUST. AVOID CONTACT W/EYES/SKIN/CLOTHES.

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

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST: REQUIRED
Protective Gloves:COMPATIBLE CHEMICAL RESISTANT
Eye Protection:CHEMICAL SAFETY GOGGLES
Other Protective Equipment:SAFETY SHOWER & EYE BATH, RUBBER BOOTS.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING. REMOVE & WASH CONTAMINATED CLOTHES BEFORE REUSE.
Supplemental Safety and Health

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

Appearance and Odor:YELLOW-ORANGE POWDER, ODORLESS.

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

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, COMBUSTIBLE MATERIALS
Stability Condition to Avoid:HEAT, SPARKS & OPEN FLAMES.
Hazardous Decomposition Products:NITROGEN OXIDES & SULFUR OXIDES.

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

Waste Disposal Methods:DISSOLVE IN WATER/ACID SOLUTION/OXIDIZED TO WATER SOLUBLE STATE. PRECIPITATE AS SULFIDE/ADJUST PH TO 7 TO COMPLETE PRECIPITATION. FILTER INSOLUBLE/DISPOSE IN HAZARDOUS WASTE SITE. DESTROY W/SODIUM HYP OCHLORITE. NEUTRALIZE BEFORE FLUSHING TO DRAIN.

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Material Safety Data Sheet
Cetylpyridinium chloride monohydrate

ACC# 79578

Section 1 - Chemical Product and Company Identification

MSDS Name: Cetylpyridinium chloride monohydrate

Catalog Numbers: AC226990000, AC226990050, AC226991000, AC226995000

Synonyms: 1-Hexadecylpyridinium chloride monohydrate; N-Cetylpyridinium chloride monohydrate.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

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

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6004-24-6	Cetylpyridinium chloride monohydrate	>96	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Danger! May be fatal if inhaled. Harmful if swallowed. Dust causes severe irritation of the eyes, skin and respiratory tract. May be harmful if absorbed through the skin.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

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

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

Inhalation: May be fatal if inhaled. Dust is irritating to the respiratory tract.

Chronic: No information found.

Section 4 - First Aid Measures

Material Safety Data Sheets, Carver Hall RM 208-A

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

Skin: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid. Wash clothing before reuse.

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

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: 4; 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. Evacuate unnecessary personnel. Approach spill from upwind.

Section 7 - Handling and Storage

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

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
Cetylpyridinium chloride monohydrate	none listed	none listed	none listed
Pyridinium, 1-hexadecyl-, chloride, anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Cetylpyridinium chloride monohydrate: No OSHA Vacated PELs are listed for this chemical. Pyridinium, 1-hexadecyl-, chloride, anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: characteristic odor

pH: 5.2 (10g/l H₂O)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 80-83 deg C

Decomposition Temperature: 234 deg C

Solubility: Soluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₂₁H₃₈ClN.H₂O

Molecular Weight: 358.01

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, confined spaces.

Incompatibilities with Other Materials: Strong oxidizing agents.

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

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 6004-24-6: UU5075000

CAS# 123-03-5: UU4900000

LD50/LC50:

Not available.

CAS# 123-03-5:

Draize test, rabbit, eye: 1%;

Draize test, rabbit, eye: 100 mg;

Draize test, rabbit, skin: 50 mg/24H Moderate;

Inhalation, rat: LC50 = 90 mg/m³/4H;

Oral, mouse: LD50 = 108 mg/kg;

Oral, rabbit: LD50 = 400 mg/kg;

Oral, rat: LD50 = 200 mg/kg;

Sensitization test (guinea pig): negative.

Carcinogenicity:

CAS# 6004-24-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 123-03-5: 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: Fish: Carp: 0.01 mg/l; 96 h; LC50 No data available.

Environmental: Biodegradable.

Physical: No information available.

Other: No information available.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure 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 (CETYLPIRIDINIUM CHLORIDE)
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6004-24-6 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# 123-03-5 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 123-03-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Material Safety Data Sheets, Carver Hall RM 208-A

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# 6004-24-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 123-03-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T+ N

Risk Phrases:

R 25 Toxic if swallowed.

R 26 Very toxic by inhalation.

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

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

WGK (Water Danger/Protection)

CAS# 6004-24-6: No information available.

CAS# 123-03-5: 3

Canada - DSL/NDSL

CAS# 123-03-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, D2B.

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

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Chromium

ACC# 05000

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium

Catalog Numbers: S79965, S799651, S93176

Synonyms: Chrome

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-47-3	CHROMIUM	>=99%	231-157-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver-gray solid.

Warning! Causes eye and skin irritation. May cause allergic skin reaction. Causes severe respiratory tract irritation. May cause lung damage. May cause kidney damage. May cause liver damage.

Target Organs: Liver.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis.

Skin: Causes skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: May cause irritation of the digestive tract. May cause liver damage.

Inhalation: Causes respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle

Material Safety Data Sheets, Carver Hall RM 208-A

pain and increased white blood cell count. May cause asthma and shortness of breath. May cause headache, coughing, fever, weight loss, and pneumoconiosis.

Chronic: Prolonged inhalation may cause respiratory tract inflammation and lung damage.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid 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: 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: Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. May burn with invisible flame. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust can be an explosion hazard when exposed to heat or flame. Finely divided dusts may exhibit pyrophoric tendencies.

Extinguishing Media: Use dry sand or earth to smother fire. Use dry chemical to fight fire. Contact professional fire-fighters immediately.

Flash Point: Not applicable.

Autoignition Temperature: 400 deg C (752.00 deg F)

Explosion Limits, Lower: .0230oz/ft³

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Isolate area and deny entry. Place under an inert atmosphere. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Use spark-proof tools and explosion proof equipment. Avoid contact with skin and eyes. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Handle under an inert atmosphere.

Storage: Keep away from heat, sparks, and flame. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids. Keep containers tightly closed. Do not expose to air. 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 general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
CHROMIUM	0.5 mg/m ³ TWA	0.5 mg/m ³ TWA 250 mg/m ³ IDLH	1 mg/m ³ TWA

OSHA Vacated PELs: CHROMIUM: 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 gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

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

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: silver-gray

Odor: odorless

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: 2640 deg C
Freezing/Melting Point: 1857.2 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 7.2 @28°C
Molecular Formula: Cr
Molecular Weight: 51.996

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Ignition sources, dust generation, exposure to air.
Incompatibilities with Other Materials: Ammonium nitrate, hydrogen peroxide, lithium, nitric oxide, potassium chlorate, sulfur dioxide, strong oxidizers, hydrochloric acid, sulfuric acid, nitrogen oxide,
Hazardous Decomposition Products: Toxic chromium oxide fumes.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7440-47-3: GB4200000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7440-47-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion. IARC Group 3: Suspected animal carcinogenic substance of potential relevance to humans. IARC Group 3: Limited or insufficient evidence for carcinogenicity in both animals and humans.

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

Section 12 - Ecological Information

Material Safety Data Sheets, Carver Hall RM 208-A

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-47-3 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# 7440-47-3: 5000 lb final RQ (no reporting of releases of this hazardous substance is required)

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7440-47-3: immediate, delayed, fire.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 313

This material contains CHROMIUM (CAS# 7440-47-3, >=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 depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 7440-47-3 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7440-47-3 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# 7440-47-3 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 40 Limited evidence of a carcinogenic effect.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7440-47-3: No information available.

Canada - DSL/NDSL

CAS# 7440-47-3 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# 7440-47-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

Material Safety Data Sheet
Chromium (III) Potassium Sulfate Dodecahydrate

ACC# 19330

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium (III) Potassium Sulfate Dodecahydrate

Catalog Numbers: S72229C, S72229F, S79967, C337-500, S76786

Synonyms: Chromium (III) Potassium sulfate, dodecadrate; Chromic Alum (Dodecahydrate); Potassium Chromium Alum Dodecahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7788-99-0	Chromium (III) Potassium Sulfate Dodecahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: grey crystals.

Warning! May cause allergic respiratory reaction. May cause allergic skin reaction. May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

Target Organs: Lungs.

Potential Health Effects

Eye: Causes eye irritation.

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

Ingestion: No hazard expected in normal industrial use.

Inhalation: Dust is irritating to the respiratory tract. Causes irritation of mucous membrane.

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

Section 4 - First Aid Measures

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

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

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromium (III) Potassium Sulfate Dodecahydrate	none listed	none listed	none listed

OSHA Vacated PELs: Chromium (III) Potassium Sulfate Dodecahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

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

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

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: purple - grey

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 400 deg C

Freezing/Melting Point: 88.9 deg C

Decomposition Temperature: Not available.

Solubility: 19.6 % in water

Specific Gravity/Density: 1.8

Molecular Formula: CrKSS2O8.12H2O

Molecular Weight: 556.9495

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, heat.

Hazardous Decomposition Products: Oxides of sulfur, chromium fumes.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7788-99-0: GB6850000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7788-99-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Mutation data reported.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

Material Safety Data Sheets, Carver Hall RM 208-A

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7788-99-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7788-99-0: immediate, delayed.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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# 7788-99-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Material Safety Data Sheets, Carver Hall RM 208-A

Hazard Symbols:

XI

Risk Phrases:

R 36/38 Irritating to eyes and skin.

Safety Phrases:

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

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

WGK (Water Danger/Protection)

CAS# 7788-99-0: No information available.

Canada - DSL/NDSL

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

Canada - WHMIS

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# 7788-99-0 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Chromium (III) Sulfate Hydrate

ACC# 04970

Section 1 - Chemical Product and Company Identification

MSDS Name: Chromium (III) Sulfate Hydrate

Catalog Numbers: C338-500

Synonyms: Chromic sulfate; dichromium sulfate; sulfuric acid chromium salt

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10101-53-8	Chromium (III) Sulfate Hydrate	100%	233-253-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green to violet to red solid.

Warning! Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

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

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Causes respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

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

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

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromium (III) Sulfate Hydrate	none listed	none listed	none listed

OSHA Vacated PELs: Chromium (III) Sulfate Hydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

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

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

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green to violet to red

Odor: odorless

pH: 1.0-2.5 5% solution

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Soluble in water.

Specific Gravity/Density:1.7-3.0

Molecular Formula:Cr₂(SO₄)₃.nH₂O

Molecular Weight:392.1648

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: None reported.

Incompatibilities with Other Materials: Hydrogen gas may be evolved from moist chromic sulfate. If damp material is sealed for a prolonged period of time, the container may rupture because of the pressure of hydrogen. Reacts violently with reducing agents, combustibles, ammonia, halides, phosphorous, sodium azide, elemental sulfur and urea.

Hazardous Decomposition Products: Oxides of sulfur, oxides of sulfur.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10101-53-8: GB7200000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10101-53-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

Material Safety Data Sheets, Carver Hall RM 208-A

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10101-53-8 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

CAS# 10101-53-8: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 10101-53-8: immediate, delayed.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 10101-53-8 is listed as a Hazardous Substance under the CWA.

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

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

OSHA:

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

STATE

CAS# 10101-53-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

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

Material Safety Data Sheets, Carver Hall RM 208-A

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

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

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 10101-53-8: 1

Canada - DSL/NDSL

CAS# 10101-53-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

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

Canadian Ingredient Disclosure List

CAS# 10101-53-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Citric Acid Anhydrous

ACC# 87772

Section 1 - Chemical Product and Company Identification

MSDS Name: Citric Acid Anhydrous

Catalog Numbers: A940-250LB

Synonyms: 2-Hydroxy-1,2,3-propanetricarboxylic 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
77-92-9	Citric acid	99.0	201-069-1

Hazard Symbols: XI

Risk Phrases: 36/37/38

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: White powder. **Caution!** Causes respiratory tract irritation. May cause digestive tract irritation. Moisture sensitive. Causes severe eye irritation. May cause skin sensitization by skin contact. Causes skin irritation.

Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes severe eye irritation and possible injury.

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

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Excessive intake of citric acid may cause erosion of the teeth.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: Causes respiratory tract irritation.

Chronic: Repeated exposure may cause sensitization 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. Do NOT allow victim to rub 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. Wash clothing before reuse.

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

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. 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. Use agent most appropriate to extinguish fire. Do NOT get water inside containers.

Flash Point: 100 deg C (212.00 deg F)

Autoignition Temperature: 1850 deg F (1,010.00 deg C)

Explosion Limits, Lower: .28

Upper: 2.29

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. Very fine particles can cause a fire or explosion. Eliminate all ignition sources. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Spill may be carefully neutralized with lime (calcium oxide, CaO). Do not get water inside containers.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

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. Do not allow contact with water. Keep from contact with moist air and steam.

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

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
Citric acid	none listed	none listed	none listed

OSHA Vacated PELs: Citric acid: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: White powder

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: 153 - 154.5 deg C

Decomposition Temperature: Not available.

Solubility: 59.2% (20°C)

Specific Gravity/Density: 1.6650g/cm³

Molecular Formula: C₆H₈O₇

Molecular Weight: 192.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

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

Incompatibilities with Other Materials: Oxidizing agents, sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), metal nitrates, alkali carbonates, alkalis, potassium tartrate, acetates, bicarbonates.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 77-92-9: GE7350000

LD50/LC50:

CAS# 77-92-9:

Draize test, rabbit, eye: 750 ug/24H Severe;

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

Oral, mouse: LD50 = 5040 mg/kg;

Oral, rat: LD50 = 3 gm/kg; <BR.

Carcinogenicity:

CAS# 77-92-9: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: No data available. Fish toxicity: LC100 goldfish 894 mg/l lifetime exposure in hard water, LD0 goldfish 625 mg/l lifetime exposure in hard water (Ellis, M.M. Detection and measurement of Stream Pollution 1937, 22, XLVII, 365, US Brit. Fisheries Bull.) Invertebrate toxicity: LD100 Daphnia magna 120 mg/l lifetime exposure in soft water, LD0 Daphnia magna 80 mg/l lifetime exposure in soft water. Toxicity threshold: Pseudomonas putida > 10 g/l; Scenedesmus quadricauda 640 mg/l; Entosiphon sulcatum 485 mg/l (Bringmann, G. et al Water Res. 1980, 14, 231-241).

Environmental: Nitrification inhibition. Nitrosomonas sp 100 mg/l no inhibition of ammonia oxidation (Hockenbury, M.R. et al J. Water Pollut. Control Fed. 1999, 49(5), 768-777). Degradation studies. 70-100% removal by activated sludge at 20°C for 120 hr (Muto, N. et al Kenkyu Hokoku-Kanto Gakuin Daigaku

Material Safety Data Sheets, Carver Hall RM 208-A

Kogakubu 1987,31(2),257-266 (Japan)).

Physical: No information available.

Other: BOD5 0.420; BOD20 0.610; ThOD 0.686 mg/l O2 respectively (Meinck,F. et al Les Eaux Residuaires Industrielles 1970). Biodegradable (Ministry of International Trade and Industry (MITI) Report 1984, Japan).

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous 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# 77-92-9 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

Material Safety Data Sheets, Carver Hall RM 208-A

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 77-92-9: acute.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

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

OSHA:

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

STATE

CAS# 77-92-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

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# 77-92-9: 0

Canada - DSL/NDSL

CAS# 77-92-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

Canadian Ingredient Disclosure List

CAS# 77-92-9 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

Material Safety Data Sheets, Carver Hall RM 208-A

ALDRICH CHEMICAL CO INC -- COBALT (II, III) OXIDE 99.995%, 20311-4 -- 6810-00N062198

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

Product ID:COBALT (II, III) OXIDE 99.995%, 20311-4

MSDS Date:09/26/1994

FSC:6810

NIIN:00N062198

MSDS Number: BYSTT

=== Responsible Party ===

Company Name:ALDRICH CHEMICAL CO INC

Box:355

City:MILWAUKEE

State:WI

ZIP:53201

Country:US

Info Phone Num:414-273-3850

Emergency Phone Num:414-273-3850

CAGE:60928

=== Contractor Identification ===

Company Name:ALDRICH CHEMICAL CO INC

Address:1001 WEST ST PAUL AVE

Box:355

City:MILWAUKEE

State:WI

ZIP:53233

Country:US

Phone:414-273-3850

CAGE:60928

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

Ingred Name:COBALT OXIDE; (COBALT (II, III) OXIDE)

CAS:1308-06-1

RTECS #:GG2500000

Fraction by Wt: 99.995%

OSHA PEL:N/K

ACGIH TLV:N/K

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

LD50 LC50 Mixture:LD50:(ORAL,RAT) >5 GM/KG

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:TARGET ORGAN:LUNGS. ACUTE:HARMFUL IF
INHALED/SWALLOWED. MAY CAUSE ALLERGIC SKIN REACTION. TO BEST OF
MFR'S KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL
PROPERTIES HAVE NOT BEEN THOROUGHLY INVE STIGATED. CHRONIC:NONE
LISTED BY MANUFACTURER.

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:IMMED FLUSH W/COPIOUS AMTS OF WATER FOR AT LEAST 15

MINS. SKIN:IMMED WASH WITH SOAP & COPIOUS AMTS OF WATER.

INHAL:REMOVE TO FRESH AIR. IF NOT BRTHG GIVE ARTF RESP. IF BRTHG IS

DFCLT, GIVE OXYG. INGEST:WASH OUT MOUTH W/WATER PROVIDED PERSON IS

Material Safety Data Sheets, Carver Hall RM 208-A

CONSCIOUS. CALL PHYS. WASH CONTAMD CLOTHING BEFORE REUSE.

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

Extinguishing Media:NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

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

Spill Release Procedures:WEAR NIOSH/MSHA APPRVD RESP, CHEM SFTY GOGG, RUBB BOOTS & HEAVY RUBB GLOVES. SWEEP UP, PLACE IN BAG & HOLD FOR WASTE DISP. AVOID RAISING DUST. VENT AREA & WASH SPILL SITE AFTER MATL PICKUP IS COMPLETE .

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:HARMFUL IF INHALED/SWALLOWED. MAY CAUSE IRRIT. MAY CAUSE ALLERGIC SKIN RXN. WEAR SUITABLE PROTECTIVE CLOTHING. HYGROSCOPIC.

Other Precautions:KEEP TIGHTLY CLOSED.

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

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .

Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.

Protective Gloves:LONG RUBB/NEOPRENE GLOVES.

Eye Protection:ANSI APPRVD CHEM WORKERS GOGGLES .

Other Protective Equipment:ANSI APPRVD EMERGENCY EYE WASH & DELUGE SHOWER .

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

NONE SPECIFIED BY MANUFACTURER.

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

Melt/Freeze Pt:M.P/F.P Text:1643F,895C

Spec Gravity:6.110

Evaporation Rate & Reference:NOT KNOWN

Solubility in Water:NOT KNOWN

Appearance and Odor:BLACK POWDER.

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

Stability Indicator/Materials to Avoid:YES

MOISTURE, REDUCING AGENTS.

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:TOXIC FUMES.

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

Waste Disposal Methods:BURY IN LANDFILL SITE APPRVD FOR DISP OF CHEMICAL & HAZARDOUS WASTES. OBSERVE ALL FEDERAL, STATE & LOCAL ENVIRONMENTAL REGULATIONS.

Material Safety Data Sheets, Carver Hall RM 208-A

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Material Safety Data Sheet

Cobalt Chloride

ACC# 91786

Section 1 - Chemical Product and Company Identification

MSDS Name: Cobalt Chloride

Catalog Numbers: AC, S75088

Synonyms: Cobalt dichloride, Cobaltous dichloride; Cobalt muriate.

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
7646-79-9	Cobaltous chloride	100	231-589-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear light-blue solid.

Warning! Harmful if swallowed. Causes respiratory tract irritation. Causes eye and skin irritation. May cause cancer based on animal studies. Hygroscopic (absorbs moisture from the air). May cause sensitization by inhalation and by skin contact.

Target Organs: Lungs, cardiovascular system, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. Chronic exposure may result in sensitization.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract irritation.

Inhalation: Causes respiratory tract irritation. May cause asthmatic attacks due to allergic sensitization of the respiratory tract.

Chronic: Cobalt compounds may cause cancer based upon 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: 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 not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Use of chelators such as BAL penicillamine and N-acetylpenicillamine should be considered.

Section 5 - Fire Fighting Measures

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

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

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Material Safety Data Sheets, Carver Hall RM 208-A

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

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cobaltous chloride	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed

OSHA Vacated PELs: Cobaltous 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 clothing to prevent skin exposure.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. 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: clear light-blue

Odor: slight - sharp odor

pH: Not available.

Vapor Pressure: 40 mm Hg @ 770C

Vapor Density: 4.5

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1049 deg C @ 760 mmHg

Freezing/Melting Point: 735 deg C

Decomposition Temperature: 400C (sublimes)

Solubility: soluble in alcohol and acetone

Specific Gravity/Density: 3.3560g/cm³

Molecular Formula: Cl₂Co

Molecular Weight: 129.84

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Moisture - oxidizing agents - alkali metals.

Hazardous Decomposition Products: Hydrogen chloride, chlorine, irritating and toxic fumes and gases, chloride fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7646-79-9: GF9800000

LD50/LC50:

CAS# 7646-79-9:

Oral, mouse: LD50 = 80 mg/kg;

Oral, rat: LD50 = 80 mg/kg;

Oral, rat: LD50 = 418 mg/kg;

Carcinogenicity:

CAS# 7646-79-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen (listed as Soluble cobalt (II) salts).

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

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure 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 LIQUID, CORROSIVE, ORGANIC, N.O.S. *	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.
Hazard Class:	6.1	6.1
UN Number:	UN2927	UN2927
Packing Group:	I	I

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7646-79-9 is listed on the TSCA inventory.

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7646-79-9: immediate, delayed, reactive.

Section 313

This material contains Cobaltous chloride (listed as Cobalt compounds), 100%, (CAS# 7646-79-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7646-79-9 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Material Safety Data Sheets, Carver Hall RM 208-A

Clean Water Act:

None of the chemicals in this 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# 7646-79-9 can be found on the following state right to know lists: Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 22 Harmful if swallowed.
R 42/43 May cause sensitization by inhalation and skin contact.
R 49 May cause cancer by inhalation.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardous waste.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7646-79-9: 2

Canada - DSL/NDSL

CAS# 7646-79-9 is listed on Canada's DSL List.

Canada - WHMIS

not available.

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

Canadian Ingredient Disclosure List

CAS# 7646-79-9 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Cobalt, certified powder, mesh 300 and finer

ACC# 05250

Section 1 - Chemical Product and Company Identification

MSDS Name: Cobalt, certified powder, mesh 300 and finer

Catalog Numbers: C363-100

Synonyms: Color Index No. 77320.

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-48-4	Cobalt	>98	231-158-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver gray or bluish white or black solid.

Danger! Flammable solid. Can be explosive when exposed to heat or flames. May cause allergic respiratory reaction. Causes eye and skin irritation. May cause allergic skin reaction. May cause lung damage. May cause cancer based on animal studies.

Target Organs: Lungs, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis.

Skin: Prolonged and/or repeated contact may cause irritation and/or dermatitis. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

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

Inhalation: Causes respiratory tract irritation. May cause asthmatic attacks due to allergic sensitization of

Material Safety Data Sheets, Carver Hall RM 208-A

the respiratory tract. May cause asthma and shortness of breath.

Chronic: Repeated exposure may cause sensitization dermatitis. Repeated exposure may cause allergic respiratory reaction (asthma). Chronic inhalation of dust may lead to restricted pulmonary function and interstitial fibrosis.

Section 4 - First Aid Measures

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

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

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

Inhalation: Remove from exposure and move to fresh air immediately. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. Material can spontaneously ignite (pyrophoric) when exposed to air at normal or slightly elevated temperatures. Flammable solid.

Extinguishing Media: Use dry sand or earth to smother fire. DO NOT USE WATER!

Flash Point: Not applicable.

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: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

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

Storage: Keep away from sources of ignition. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cobalt	0.02 mg/m ³ TWA	0.05 mg/m ³ TWA (dust and fume) 20 mg/m ³ IDLH (dust and fume)	0.1 mg/m ³ TWA (dust and fume)

OSHA Vacated PELs: Cobalt: 0.05 mg/m³ TWA (dust and fume)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: silver gray or bluish white or black

Odor: none reported

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not available.

Viscosity: Not applicable.

Boiling Point: 2870 deg C

Freezing/Melting Point: 1495 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble in water.

Specific Gravity/Density: 8.92

Molecular Formula: Co

Molecular Weight: 58.9332

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, dust generation, strong acids, oxidizers.

Incompatibilities with Other Materials: Pyrophoric cobalt decomposes acetylene in the cold and the metal becomes incandescent. Fused ammonium nitrate can react explosively with powdered cobalt. Pyrophoric cobalt, a black powder, burns brilliantly when exposed to air.

Hazardous Decomposition Products: Oxides of cobalt.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-48-4: GF8750000; GF8850000; GG0375000

LD50/LC50:

CAS# 7440-48-4:

Oral, rat: LD50 = 6171 mg/kg;

Carcinogenicity:

CAS# 7440-48-4:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 7/1/92 (powder)
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

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

Material Safety Data Sheets, Carver Hall RM 208-A

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	METAL POWDERS, FLAMMABLE, N.O.S.	No information available.
Hazard Class:	4.1	
UN Number:	UN3089	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-48-4 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 7440-48-4: 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

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-48-4: immediate, delayed, fire.

Section 313

This material contains Cobalt (CAS# 7440-48-4, >98%), 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.

Material Safety Data Sheets, Carver Hall RM 208-A

Clean Water Act:

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

OSHA:

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

STATE

CAS# 7440-48-4 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 Cobalt, 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 42/43 May cause sensitization by inhalation and skin contact.
R 53 May cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.
S 24 Avoid contact with skin.
S 37 Wear suitable gloves.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7440-48-4: 1

Canada - DSL/NDSL

CAS# 7440-48-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D2A.

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

Canadian Ingredient Disclosure List

CAS# 7440-48-4 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Cobalt(II) Nitrate Hexahydrate, P.A.

ACC# 00456

Section 1 - Chemical Product and Company Identification

MSDS Name: Cobalt(II) Nitrate Hexahydrate, P.A.

Catalog Numbers: AC219210000, AC219211000, AC219215000

Synonyms: Nitric Acid Cobalt Salt Hexahydrate

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
10026-22-9	COBALT (II) NITRATE HEXAHYDRATE	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red to brown solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause allergic respiratory reaction. May cause allergic skin reaction. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. May be harmful if swallowed. May cause blood abnormalities. May cause cardiac disturbances.

Target Organs: Heart, respiratory system, red blood cells.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Prolonged and/or repeated contact may cause irritation and/or dermatitis. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. Excessive ingestion may increase red blood cells and decrease blood pressure. May cause sensation of heat and enlargement of the

Inhalation: Dust is irritating to the respiratory tract. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause asthmatic attacks due to allergic sensitization of the

Material Safety Data Sheets, Carver Hall RM 208-A

respiratory tract.

Chronic: Repeated exposure may cause allergic respiratory reaction (asthma).

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: Administration of calcium disodium EDTA may be useful in acute poisoning with its use at the discretion of qualified medical personnel.

Section 5 - Fire Fighting Measures

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

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

Flash Point: Noncombustible.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: Not published.

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Wash hands before eating. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid 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: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
COBALT (II) NITRATE HEXAHYDRATE	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed

OSHA Vacated PELs: COBALT (II) NITRATE HEXAHYDRATE: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to 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 to brown

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: 55-56C

Decomposition Temperature: 74 deg C

Solubility: Soluble.

Material Safety Data Sheets, Carver Hall RM 208-A

Specific Gravity/Density: 2.49

Molecular Formula: $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$

Molecular Weight: 291.0234

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated.

Conditions to Avoid: Incompatible materials, excess heat, combustible materials, reducing agents, temperatures above 100°C.

Incompatibilities with Other Materials: Reacts violently if mixed with reducing agents, organic matter, and other flammable and combustible materials including wood, paper, sulfur, aluminum, phosphorus, hydroxylamine, phosphinates, alkyl esters, ammonium hexacyanoferrate (4-), carbon, tin (II) chloride, and flammable liquids.

Hazardous Decomposition Products: Nitrogen oxides, irritating and toxic fumes and gases.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10026-22-9: QU7355500

LD50/LC50:

CAS# 10026-22-9:

Oral, rat: LD50 = 691 mg/kg;

Carcinogenicity:

CAS# 10026-22-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen (listed as Soluble cobalt (II) salts).

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

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No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NITRATES, INORGANIC, N.O.S.	No information available.
Hazard Class:	5.1	
UN Number:	UN1477	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10026-22-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

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CAS # 10026-22-9: immediate, delayed, fire.

Section 313

This material contains COBALT (II) NITRATE HEXAHYDRATE (listed as Cobalt compounds), 100%, (CAS# 10026-22-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 10026-22-9 (listed as Cobalt 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.

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

OSHA:

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

STATE

CAS# 10026-22-9 can be found on the following state right to know lists: Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

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

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

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 Wear suitable gloves.

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

WGK (Water Danger/Protection)

CAS# 10026-22-9: 2

Canada - DSL/NDSL

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

Canada - WHMIS

WHMIS: Not available.

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

Canadian Ingredient Disclosure List

CAS# 10026-22-9 is not listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

Material Safety Data Sheet
Cobalt(II) sulfate heptahydrate

ACC# 05370

Section 1 - Chemical Product and Company Identification

MSDS Name: Cobalt(II) sulfate heptahydrate

Catalog Numbers: S79974, S799741, C386-500

Synonyms: Cobalt sulfate heptahydrate; Cobalt(II) sulfate (1:1) heptahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10026-24-1	Cobalt sulfate heptahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-pink solid.

Warning! Causes respiratory tract irritation. Causes eye and skin irritation. May be harmful if swallowed. May cause cancer based on animal studies. Potential cancer hazard.

Target Organs: No data found.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Prolonged and/or repeated contact may cause irritation and/or dermatitis. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

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

Inhalation: Causes respiratory tract irritation.

Chronic: Cobalt compounds may cause cancer based upon animal studies.

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.

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. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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

Section 6 - Accidental Release Measures

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

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

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and

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inhalation.

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

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cobalt sulfate heptahydrate	0.02 mg/m ³ TWA (as Co) (listed under Cobalt, inorganic compounds).	none listed	none listed
Cobalt sulfate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Cobalt sulfate heptahydrate: No OSHA Vacated PELs are listed for this chemical.
Cobalt 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: 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-pink

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 420 deg C

Freezing/Melting Point: 96.7 deg C

Decomposition Temperature: 420 deg C

Solubility: 60.4% (3 C)

Specific Gravity/Density: 1.948 @ 25°C

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Molecular Formula: CoSO₄·7H₂O

Molecular Weight: 281.0846

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Dust generation, moisture.

Incompatibilities with Other Materials: None reported.

Hazardous Decomposition Products: Oxides of sulfur.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10026-24-1: GG3200000

CAS# 10124-43-3: GG3100000

LD50/LC50:

CAS# 10026-24-1:

Oral, rat: LD50 = 582 mg/kg;

CAS# 10124-43-3:

Oral, mouse: LD50 = 584 mg/kg;

Oral, rat: LD50 = 424 mg/kg;

Oral, rat: LD50 = 424 mg/kg;

Carcinogenicity:

CAS# 10026-24-1:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Cobalt, inorganic compounds').
- **California:** carcinogen, initial date 6/2/00
- **NTP:** Not listed.
- **IARC:** Group 2B carcinogen

CAS# 10124-43-3:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/20/05
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

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

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humans. IARC Group 2B: No data available on human carcinogenicity, however sufficient evidence of carcinogenicity in animals.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10026-24-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if

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the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10124-43-3 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 # 10026-24-1: immediate, delayed.

Section 313

This material contains Cobalt sulfate heptahydrate (listed as Cobalt, inorganic compounds), 100%, (CAS# 10026-24-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 10026-24-1 (listed as Cobalt compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

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

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

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

OSHA:

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

STATE

CAS# 10026-24-1 can be found on the following state right to know lists: New Jersey, (listed as Cobalt compounds), Pennsylvania, (listed as Cobalt compounds), Minnesota, (listed as Cobalt, inorganic compounds).

CAS# 10124-43-3 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 Cobalt sulfate heptahydrate, a chemical known to the state of California to cause cancer. WARNING: This product contains Cobalt sulfate anhydrous, a chemical known to the state of California to cause cancer.

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 22 Harmful if swallowed.

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

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term

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adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

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

S 53 Avoid exposure - obtain special instructions before use.

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

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

WGK (Water Danger/Protection)

CAS# 10026-24-1: No information available.

CAS# 10124-43-3: 2

Canada - DSL/NDSL

CAS# 10124-43-3 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# 10026-24-1 is not listed on the Canadian Ingredient Disclosure List.

CAS# 10124-43-3 is listed on the Canadian Ingredient Disclosure List.

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FISHER SCIENTIFIC CO -- COBALTOUS CHLORIDE HEXAHYDRATE -- 6810-00-227-0409

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

Product ID:COBALTOUS CHLORIDE HEXAHYDRATE

MSDS Date:03/15/1989

FSC:6810

NIIN:00-227-0409

MSDS Number: BDKPL

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC CO

Address:52 FADEM RD

City:SPRINGFIELD

State:NJ

ZIP:07081-3116

Country:US

Info Phone Num:201-379-1400

Emergency Phone Num:201-796-7100

Preparer's Name:GASTON L. PILLORI

CAGE:94480

=== Contractor Identification ===

Company Name:FISHER SCIENTIFIC COMPANY

Address:52 FADEM ROAD.DOMESTIC DIVISION

City:SPRINGFIELD

State:NJ

ZIP:07081

Country:US

Phone:201-796-7100

CAGE:94480

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

Ingred Name:COBALT CHLORIDE

CAS:7791-13-1

RTECS #:GG0200000

Fraction by Wt: 100%

OSHA PEL:0.1 MG/M3 (CO)

ACGIH TLV:0.05 MG/M3 (CO)

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

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE: INHALATION- DEATH, RHINITIS, IRRITATION OF RESPIRATORY SYSTEM, TRACHEITIS. EYES- IRRITATION. SKIN-IRRITATION, DERMATITIS. INGESTION- ABDOMINAL DISTRESS, NERVE DEAFNESS, DEATH. CHRONIC: ASTHMA, PNEUMONITIS, DERMATITIS. DAMAGE TO LIVER AND KIDNEYS.

Explanation of Carcinogenicity:NONE

Effects of Overexposure:INHALATION: HEADACH, WEAKNESS, WHEEZING, SNEEZING. EYES: BURNING SENSATION, STINGING. SKIN: REDNESS, ITCHING, RASH. INGESTION: STOMACH PAIN, VOMITING, DIARRHEA, SKIN RASH, TINNITIS.

Medical Cond Aggravated by Exposure:PRE-EXISTING SKIN AND RESPIRATORY CONDITIONS MAY BE AGGRAVATED.

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

First Aid:INHALATION: GET TO FRESH AIR. RESUSCITATE IF NEEDED. SKIN:

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REMOVE CONTAMINATED CLOTHING. WASH SKIN WITH SOAP AND WATER FOR 20 MINUTES. EYE: WASH FOR 20 MINUTES. INGESTION: IF CONSCIOUS, GIVE 2 TO 4 GL ASSES OF WATER AND INDUCE VOMITING. SEEK MEDICAL ATTENTION FOR ALL THE ABOVE CONDITIONS.

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

Flash Point:NONE

Extinguishing Media:USE MEDIA APPROPRIATE FOR SURROUNDING FIRE.

Fire Fighting Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. MOVE CONTAINERS FROM FIRE IF IT CAN BE DONE AT NO RISK. DO NOT SCATTER SPILLED MATERIAL.

Unusual Fire/Explosion Hazard:NONE SPECIFIED BY MANUFACTURER.

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

Spill Release Procedures:OCCUPATIONAL SPILL: WHEN NOT INVOLVED IN FIRE, DO NOT ALLOW MATERIAL TO CONTAMINATE SEWERS AND WATER SOURCES. ABSORB MATERIAL IN INERT ABSORBANT AND PLACE IN CONTAINER FOR DISPOSAL.

Neutralizing Agent:NONE

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

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE MATERIALS. KEEP IN TIGHTLY CLOSED CONTAINER. STORE IN A COOL, DRY AREA.

Other Precautions:IMMEDIATELY DEADLY TO LIFE AND HEALTH (IDLH) CONDITIONS = 20 MG/M3 (CO). POISONING MAY AFFECT LIVER, KIDNEYS, BLOOD, RESPIRATORY, CARDIOVASCULAR, ENDOCRINE, GATROINTESTINAL, AND NERVOUS SYSTEMS. SKIN SENSITIZER.

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

Respiratory Protection:USE NIOSH/MSHA APPROVED RESPIRATOR FOR DUST AND MISTS.

Ventilation:USE ADEQUATE MECHANICAL VENTILATION.

Protective Gloves:RUBBER

Eye Protection:SAFETY GLASSES/CHEMICAL SPLASH GOGGLES

Other Protective Equipment:CLOTHING TO PREVENT PROLONGED OR REPEATED CONTACT. EYE WASH STATION & SAFETY SHOWER.

Work Hygienic Practices:PRACTICE GOOD PERSONAL HYGENE AFTER USE. DO NOT EAT, DRINK, OR SMOKE UNTIL HANDS ARE WASHED.

Supplemental Safety and Health
DO NOT WEAR CONTACT LENSES WHEN USING.

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

HCC:N1

Boiling Pt:B.P. Text:1920F,1049C

Melt/Freeze Pt:M.P/F.P Text:189F,87C

Spec Gravity:1.9

pH:4.2

Solubility in Water:APPRECIABLE

Appearance and Odor:PINK TO RED,SLIGHTLY DELIQUESCENT,PRISMATIC CRYSTL

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

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Stability Indicator/Materials to Avoid: YES

METALS, POTASSIUM, AND SODIUM. STRONG OXIDIZING AGENTS.

Stability Condition to Avoid: EXCESSIVE HEAT, SPARKS, OPEN FLAME.

Hazardous Decomposition Products: TOXIC OXIDES OF COBALT AND CORROSIVE FUMES OF CHLORINE.

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

Waste Disposal Methods: CONTACT LOCAL ENVIRONMENTAL MANAGER. DIPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

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Cobaltous nitrate

- Cobalt dinitrate
- Cobalt(2+) nitrate
- Cobalt(II) nitrate (1:2)

Formula	Co(NO ₃) ₂
Structure	
Description	Odorless red solid.
Uses	Manufacture of cobalt pigments & invisible inks, decorating stoneware & porcelain, prepn of catalyst, prodn of vitamin b12 supplements.

Registry Numbers and Inventories.

CAS	10141-05-6
NIH PubChem CID	25000
EC (EINECS/ELINCS)	233-402-1
RTECS	GG1109000
RTECS class	Tumorigen; Reproductive Effector
UN (DOT)	1477
Merck	12,2505
Beilstein/Gmelin	20108 (G)
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	CoN2O6
Formula mass	182.94
Melting point, °C	55.0
Odor threshold	Odorless

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Density	2.49 g/cm ³
Solubility in water	soluble

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Keep away from combustible materials. Avoid contact unless wearing appropriate protective clothing. Stop leak if you can do it without risk. With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.
Stability	Normally stable, reactive under extreme conditions.
Incompatibilities	May react explosively.

Fire.

Fire fighting	Fire fighting phases: use water spray. Wear self-contained breathing apparatus due to decomposition above 165 degrees fahrenheit, with release of toxic gaseous oxides of nitrogen.
Fire potential	Nonflammable.
Hazards	May explode from heat or contamination. May react explosively with hydrocarbons (fuels). May ignite combustibles.
Combustion products	Toxic oxides of nitrogen may form in fire.
Special	O

Health.

Exposure limit(s)	IDHL: 20 mg/m ³
Carcinogen	G-A3, I-2B
Exposure effects	Administration of cobalt chloride to pregnant rats in doses up to 100 mg/kg/day did not produce teratogenicity or fetotoxicity. CASE REPORT - A 31-year-old woman with severe cobalt-induced pulmonary fibrosis delivered a normal full term infant. Throughout the pregnancy, supplemental oxygen was required during exercise due to deterioration of respiratory capacity. Inhalation exposure or respiratory disease is present.
Ingestion	Ingestion or inhalation of cobalt causes nausea, vomiting, diarrhea, and colicky abdominal pain.
Inhalation	An interstitial fibrotic pulmonary process has been described among hard metal workers and diamond polishers.

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Skin Contact may result in injury, burns and death.

Eyes See Skin.

First aid

Ingestion Give large amount of water; induce vomiting; call a doctor.

Inhalation Move to fresh air; if breathing has stopped, begin artificial respiration and call a doctor.

Skin Flush with water.

Eyes Flush with water for at least 15 min.

Transportation.

UN number 1477

Response guide [140](#)

Hazard class 5.1



Packing Group II; III

USCG CHRIS Code CCO

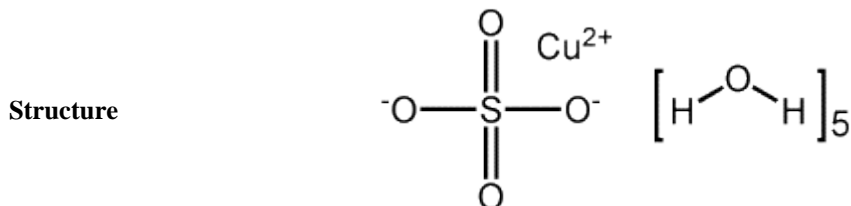
[USCG Compatatibility Group](#) 20 Alcohols, Glycols

IMO Pollution Category D

Copper(II) sulfate, pentahydrate

- Cupric sulfate pentahydrate
- Bluestone
- Blue vicking
- Blue vitriol
- Calcanthite
- Blue copperas

Formula CuSO₄·5H₂O



Description Blue crystalline granules or powder. Odorless. White when dehydrated.

Uses Algaeicide, fungicide, insecticide, water treatment, molluscicide, nematicide.

Registry Numbers and Inventories.

CAS	7758-99-8
NIH PubChem CID	24463
EC (EINECS/ELINCS)	616-477-9
EC Index Number	029-004-00-0
EC Class	Xn; R22, Xi; R36/38, N; R50-53
RTECS	GL8900000
RTECS class	Agricultural Chemical and Pesticide; Tumorigen; Mutagen; Human Data
UN (DOT)	9109
Merck	13,2682
Beilstein/Gmelin	7192 (G)
EPA OPP	24401
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Philippiens PICCS	Listed

Properties.

Formula CuH₁₀O₉S

Formula mass 249.68

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Melting point, °C	110 (decomposes)
Vapor density (air=1)	8.64
Density	2.284 g/cm ³ (20 C)
Solubility in water	316 g/L (20 C)
Dielectric constant	7.8 (17 - 22 C)
Thermal expansion	0.000096/K
Heat of fusion	28.88 kJ/mol

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from moisture. Store under an inert atmosphere.
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. Do not ingest or inhale. Handle under an inert atmosphere. Store protected from air.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere.
Stability	Stable at room temperature in closed containers under normal storage and handling conditions. Air sensitive
Incompatibilities	Moisture, air, steel, finely powdered metals, hydroxylamine, magnesium, hydrazine, nitromethane.
Decomposition	Oxides of sulfur, irritating and toxic fumes and gases, oxides of copper, copper 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. Substance is noncombustible. 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. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.
Fire potential	Nonflammable
Hazards	Containers may explode when heated.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.
NEPA	Health
	2

Material Safety Data Sheets, Carver Hall RM 208-A

Flammability 0

Reactivity 0

Health.

Poison_Class	3 (Strong toxins)
Exposure effects	Prolonged or repeated eye contact may cause conjunctivitis. May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Individuals with Wilson's disease are unable to metabolize copper. Thus, copper accumulates in various tissues and may result in liver, kidney, and brain damage. Laboratory experiments have resulted in mutagenic effects. May cause allergic skin reaction in some individuals. Chronic copper poisoning in man is recognized in the form of Wilson's disease.
Ingestion	Harmful if swallowed. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. Ingestion of large amounts of copper salts may cause bloody stools and vomit, low blood pressure, jaundice and coma. Ingestion of copper compounds may produce systemic toxic effects to the kidney and liver and central nervous excitation followed by depression.
Inhalation	May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Causes respiratory tract irritation with possible burns.
Skin	May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Causes skin irritation and possible burns. May cause itching eczema.
Eyes	Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities. Causes eye irritation and possible burns.
First aid	
Ingestion	Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation	Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Skin	Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 9109

Response guide [171](#)

Hazard class 9.2

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HS Code

2833 25 00

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FISHER SCIENTIFIC -- CUPRIC SULFATE -- 6810-00F007249

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

Product ID:CUPRIC SULFATE

MSDS Date:01/01/1987

FSC:6810

NIIN:00F007249

MSDS Number: BXNN

==== Responsible Party ====

Company Name:FISHER SCIENTIFIC/FAIR LAWN, NJ 07410

Emergency Phone Num:(201) 796-7100

CAGE:1B464

==== Contractor Identification ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV

Address:1 REAGENT LANE

Box:City:FAIRLAWN

State:NJ

ZIP:07410-2802

Country:US

Phone:201-796-7100

CAGE:1B464

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

Ingred Name:CUPRIC SULFATE (SARA III)

CAS:7758-98-7

RTECS #:GL8800000

Fraction by Wt: 100%

OSHA PEL:1 MG CU/M3

ACGIH TLV:1 MG/M3

EPA Rpt Qty:10 LBS

DOT Rpt Qty:10 LBS

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

Effects of Overexposure:IRRITATION OF THE NASAL MUCOUS MEMBRANES, EYE & CONJUNCTIVITIS, LIVER, KIDNEY DAMAGE, VOMITING.

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

First Aid:INHALATION: REMOVE TO FRESH AIR. SKIN: REMOVE CONTAMINATED CLOTHING/SHOES. WASH AFFECTED AREAS W/SOAP/MILK DETERGENT/WATER. EYES: WASH W/WATER 20 MINS. INGESTION: IF CONSCIOUS, GIVE 2 TO 4 GLASSES OF WATER, & INDUCE VOMITING. GET MEDICAL ATTENTION.

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

Flash Point:NON-FLAMMABLE

Extinguishing Media:DRY CHEMICAL, WATER FOG OR ALCOHOL FOAM.

Fire Fighting Procedures:SCBA W/FULL FACEPIECE IN PRESSURE-DEM AND.

Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE/EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME.

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

Spill Release Procedures:DON'T TOUCH SPILLED MATERIAL. FOR SMALL SPILLS, TAKE UP W/SAND OR OTHER ABSORBENT MARIA/PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR SMALL DRY SPILLS, W/CLN SHOVEL

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PLACE MATERIAL INTO CLEAN, DRY CONTAINER & COVER. MOVE FROM SPI AREA.

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

Respiratory Protection:HIGH LEVELS: SCBA W/FULL FACEPIECE, HELMET, OR HOOD.

Ventilation:PROVIDE LOCAL EXHAUST VENTILATION TO KEEP 200C

Spec Gravity:3.6

Solubility in Water:12.5%

Appearance and Odor:GRAYISH-WHITE TO GREENISH-WHITE RHOMBIC CRYSTALS

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

Stability Indicator/Materials to Avoid:YES

HYDROXYLAMINE, SODIUM HYPOBROMITE, MAGNESIUM, .

Stability Condition to Avoid:AVOID THERMAL DECOMPOSITION AT 650C FOR ANHYDROUS.

Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS INCLUDE TOXIC GASES.

Conditions to Avoid Polymerization:AVOID CONTACT/STORAGE WITH SUBSTANCE IN THE REACTIVITY SEC.

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Material Safety Data Sheets, Carver Hall RM 208-A

ALDRICH CHEMICAL CO -- COPPER (I) OXIDE 97%, 20882-5 -- 6810-00N043753

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

Product ID:COPPER (I) OXIDE 97%, 20882-5

MSDS Date:04/28/1993

FSC:6810

NIIN:00N043753

MSDS Number: BTLNB

=== 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:COPPER (I) OXIDE

CAS:1317-39-1

RTECS #:GL8050000

Fraction by Wt: 97%

OSHA PEL:N/K

ACGIH TLV:N/K

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

LD50 LC50 Mixture:LD50:(ORAL,RAT)470 MG/KG

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:HARMFUL IF INHALED OR SWALLOWED.

CAUSES SKIN/EYE IRRITATION. MATERIAL IS IRRITATING TO MUC MEMBRANES AND UPPER RESPIRATORY TRACT. CHRONIC COPPER POISONING IS TYPIFIED BY HEPATIC CIRRHOSIS, BRAIN DAM & DEMYELINATION, KIDNEY DEFECTS, AND COPPER DEPOSITION IN CORNEA AS EXEMPLIFIED BY HUMANS W/WILSON'S (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HLTH HAZ: DISEASE. IT HAS ALSO BEEN REPORTED THAT COPPER POISONING HAS LEAD TO HEMOLYTIC ANEMIA AND ACCELERATES ARTERIOSCLEROSIS.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

First Aid:EYES: IMMED FLUSH W/COPIOUS AMTS OF WATER FOR @ LST 15 MIN.

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ASSURE ADEQ FLUSHING OF EYES BY SEPARATING LIDS W/ FINGERS.
SKIN:IMMED FLUSH W/COPIOUS AMTS OF WATER FOR @ LST 15 MIN WHILE
REMOVING CONTAMD CLTHG & SHOES. REMOE & WASH CONTAMD CLTHG
PROMPTLY. INHAL: REMOVE TO FRESH AIR. IF NOT BRTHG GIVE ARTF RESP.
IF BRTHG IS DFCLT, GIVE OXYGEN. INGEST: WASH OUT MOUTH W/WATER
PROVIDED PERSON (SUPP DATA)

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

Extinguishing Media:NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE
TO SURROUNDING FIRE CONDITIONS.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

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

Spill Release Procedures:WEAR NIOSH/MSHA APPRVD SCBA, RUBBER BOOTS &
HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE
DISP. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER
MATERIAL PICKUP IS COMPL ETE.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:DO NOT GET IN EYES, ON SKIN/CLTHG. DO
NOT BREATHE DUST. IRRITANT. KEEP TIGHTLY CLSD. TOXIC. AIR AND
MOISTURE SENSITIVE.

Other Precautions:COPPER (I) OXIDE IS STABILIZED WITH NITRIC ACID AND
ACETONE.

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

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR IN NONVENTILATED
AREAS &/OR EXPSOURE ABOVE ACGHI TLV.

Ventilation:USE ONLY IN A CHEMICAL FUME HOOD.

Protective Gloves:LONG RUBBER/NEOPRENE GAUNTLET GLOVES.

Eye Protection:CHEMICAL SAFETY GOGGLES.

Other Protective Equipment:RUBBER APRON. SAFETY SHOWER AND EYE BATH.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

FIRST AID PROC: IS CONSCIOUS. CALL A PHYSICIAN.

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

HCC:T6

Spec Gravity:6

Appearance and Odor:RED POWDER

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

Stability Indicator/Materials to Avoid:YES

OXIDIZING AGENTS, AIR SENSITIVE, MOISTURE SENSITIVE.

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:NATURE OF DECOMPOSITION PRODUCTS NOT
KNOWN.

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

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Waste Disposal Methods: BURY IN A LANDFILL SITE APPROVED FOR THE DISPOSAL OF CHEMICAL AND HAZARDOUS WASTES. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

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CHEM SERVICE INC -- CUPRIC BROMIDE, I-47 -- 6810-00N067460

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

Product ID:CUPRIC BROMIDE, I-47

MSDS Date:09/01/1988

FSC:6810

NIIN:00N067460

MSDS Number: CBFWW

=== Responsible Party ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Info Phone Num:215-692-3026

Emergency Phone Num:215-692-3026

CAGE:84898

=== Contractor Identification ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Phone:215-692-3026

CAGE:84898

Company Name:CHEM SERVICE, INC

Address:660 TOWER LN

Box:599

City:WEST CHESTER

State:PA

ZIP:19301-9650

Country:US

Phone:610-692-3026

CAGE:8Y898

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

Ingred Name:CUPRIC BROMIDE

CAS:7789-45-9

OSHA PEL:N/K

ACGIH TLV:N/K

Ingred Name:SUPDAT:SUPPORTING MEASURES UNTIL MED ASSISTANCE HAS
ARRIVED. INGEST:DO NOT ADMIN LIQS/INDUCE VOMIT TO UNCON OR (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:CONVULSING PERSON. IF SWALLOWED, DRING 1-2 GLASSES OF
WATER. CONT POIS CTL CTR IMMED IF NEC. GET MED ATTN (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:IF NEC. IF PATIENT IF VOMITING-WATCH CLOSELY TO MAKE
SURE AIRWAY DOES NOT BECOME OBSTRUCTED BY VOMIT.
RTECS #:9999999ZZ

Ingred Name:EYE PROT:AND FULL LENGTH FACE SHIELD .
RTECS #:9999999ZZ

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OSHA PEL:NOT RELEVANTLE

===== 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:CONT LENSES SHOULD NOT BE WORN IN LAB.
ALL CHEMS SHOULD BE CONSIDERED HAZ-AVOID DIRECT PHYSICAL CONT! CAN
CAUSE EYE & SKIN IRRIT. CAN BE HARMFUL IF ABSORBED THROUGH SKIN,
INHALED AND SWALLOWED. RPTD E XPOS TO VAPS &/OR DUST CAN CAUSE EYE
INJURY. DUST &/OR VAPS CAN CAUSE IRRIT TO RESP TRACT. CAN CAUSE
(EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZS:NERV SYS INJURY. CAN CAUSE LIVER &
KIDNEY INJURY. CAN CAUSE GI DISTURBS. POSS CHOLINESTERASE
INHIBITOR-MAY CAUSE SEIZURES; NAUS; VOMIT; AIRWAY OBSTRUCTION &/OR
INCREASED MUC SECRETIONS IN LU NGS. CAN BE IRRIT TO MUC MEMBS.
INGEST MAY CAUSE DIARR. ASSUME CHEM IS TOX & USE SPECIAL CARE TO
AVOID CONT.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

First Aid:AN ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFT OF POIS.
IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE CAN BE
OBTAINED FROM POIS CTL CTR. EYES:FLUSH CONTINUOUSLY W/WATER FOR @
LST 15 MIN. SKIN:FLUSH W/WATER FOR 15-20 MIN.IF NO BURNS HAVE
OCCURRED-USE SOAP & WATER TO CLEANSE. REMOVE & WASH CONTAM CLTHG.
DO NOT WEAR SHOES/CLTHG UNTIL ABSOLUTELY FREE OF ALL CHEM ODORS.
(SUPDAT)

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

Extinguishing Media:CARBON DIOXIDE OR DRY CHEMICAL POWDER. DO NOT USE
WATER.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NONE SPECIFIED BY MANUFACTURER.

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

Spill Release Procedures:EVACUATE AREA. WEAR APPROPRIATE OSHA-REGULATED
EQUIPMENT. VENTILATE AREA. SWEEP UP AND PLACE IN AN APPROPRIATE
CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE
ANY RESIDUES.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:USE APPROP OSHA/MSMA APPRVD SFTY
EQUIP. AVOID CONT W/SKIN, EYES & CLTHG. KEEP TIGHTLY CLSD & STORE
IN COOL, DRY PLACE. STORE ONLY W/COMPATIBLE CHEMS.
Other Precautions:PERSONS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD
NOT HNDL CHEM/ITS CNTNR. FURNISHED FOR LAB USE ONLY! MAY NOT BE
USED AS DRUGS, COSMETICS, AGRICULTURAL/PESTICIDAL PRODS, FOOD
ADDITIVES/AS HOUSEHOLD CHEMS.

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

Respiratory Protection:USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .

Ventilation:THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPRVD CHEM WORKERS GOGGS (ING 5)

Other Protective Equipment:ANSI APPROVED EMERGENCY EYE WASH AND DELUGE SHOWER .

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

MATLS TO AVOID:ALKALINE PESTICIDES. FIRST AID PROC:INHAL:REMOVE TO FRESH AIR. ADMIN OXYG IF PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS EXHIBITING SIGNS OF SHOCK-KEEP WARM & QUIET. GET MED ATTN IF NEC. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE (ING 2)

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

Melt/Freeze Pt:M.P/F.P Text:928F,498C

Spec Gravity:4.77

Solubility in Water:SOLUBLE

Appearance and Odor:BLACK CRYSTALLINE SOLID.

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

Stability Indicator/Materials to Avoid:YES

REACTS W/WATER & MOST REACTIVE HYDROGEN CMPDS. INCOMPAT W/IRON & ZINC & OTHER LIGHT METALS, COPPER & MERCURY OR (SUPDAT)

Stability Condition to Avoid:DO NOT USE MAGNESIUM/ALUMINUM OR THEIR ALLOYS AS CONTAINERS.

Hazardous Decomposition Products:DECOMPOSITION LIBERATES TOXIC FUMES. DECOMPOSITION PRODUCTS ARE CORROSIVE. DECOMPOSED BY CHLORINE GAS.

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

Waste Disposal Methods:DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS . DISPOSE OF IN AN APPROVED CHEMICAL LANDFILL.

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Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- CUPRIC CARBONATE -- 6810-00N048718

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

Product ID:CUPRIC CARBONATE

MSDS Date:06/11/1993

FSC:6810

NIIN:00N048718

MSDS Number: CDWJC

=== 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:ING 19: SUBSEQUENT COURSES SHOULD NOT EXCEED 50 MG/KG/DAY.
DAILY URINALYSES SHOULD NOT BE DONE DURING TREATMENT (ING 21)
RTECS #:9999999ZZ

Ingred Name:ING 20: PERIOD. DOSAGE SHOULD BE REDUCED IF ANY UNUSUAL
URINARY FINDINGS APPEAR. INTRAVENOUS ADMINISTRATION IS (ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 21: CONTRAINDICATED IN PRESENCE OF ELEVATED
CEREBROSPINAL FLUID PRESS. PENICILLAMINE IS ALSO EFFECTIVE IN (ING
23)
RTECS #:9999999ZZ

Ingred Name:ING 22: COPPER POIS. GIVE UP TO 100 MG/KG/DAY (MAX 1 G/DAY)
DIVIDED INTO 4 DOSES FOR NO LONGER THAN 1 WK. IF A (ING 24)
RTECS #:9999999ZZ

Ingred Name:ING 23: LONGER ADMIN PERIOD IS WARRANTED, DOSAGE SHOULD NOT
EXCEED 40 MG/KG/DAY. GIVE DRUG ORALLY, HALF-HOUR (ING 25)
RTECS #:9999999ZZ

Ingred Name:ING 24: BEFORE MEALS. ANTIDOTE SHOULD BE ADMINISTERED BY
QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

Ingred Name:ING 5: SORE THROAT, ABDOM PAIN, DIARR & VOMIT. CHRONIC:
INHAL: ATROPIC CHANGES IN MUC MEMB HAVE BEEN REPORTED FOR(ING 7)
RTECS #:9999999ZZ

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Ingred Name:ING 6: EXTENDED EXPOS TO DUSTS OF COMPLEX COPPER SALTS.
COPPER IONS MAY BE ABSORBED BY INHAL W/POSS SYSTEMIC TOX (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7: EFTS OF INTRAVASCULAR HEMOLYSIS, HEPATIC & RENAL
NECROSIS. INHAL OF COPPER CONTAINING SPRAY IS REPORTED (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8: TO BE ASSOC W/INCRD INCIDENCE OF LUNG CANCER & POSS
HEPATIC INJURY. SKIN: RPTD/PRLNG CONT MAY CAUSE DERM.(ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9: SKIN SENSIT MAY OCCUR IN PREVIOUSLY EXPOSED PERS.
GREENISH DISCOLORATION OF SKIN & HAIR HAS BEEN REPORTED(ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10: IN COPPER WORKERS. EYES: MAY CAUSE CONJ, PAIN, &
BLURRED VISION. INGEST: HEMOLYTIC ANEMIA IS PROMINENT (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11: IN CHRONIC COPPER EXPOSURES IN ANIMALS.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: LIDS, UNTIL NO EVIDENCE OF CHEM REMAINS (AT
LEAST 15-20 MIN). CONTINUE IRRIGATING W/NORM SALINE (ING 14)
RTECS #:9999999ZZ

Ingred Name:ING 13: UNTIL PH HAS RETURNED TO NORM (30-60 MIN). COVER
W/STERILE BANDAGES. GET MED ATTN IMMED. INGEST: DILUTE (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14: POIS IMMED W/LGE AMTS OF WATER/MILK & REMOVE BY
GASTRIC LAVAGE UNLESS VICTIM IS ALREADY VOMIT. GET MED (ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15: ATTN IMMED. ADMIN OF GASTRIC LAVAGE SHOULD BE
PERFORMED BY QUALIFIED MED PERS. ANTIDOTE: COPPER POIS: (ING 17)
RTECS #:9999999ZZ

Ingred Name:ING 16: GIVE CALCIUM DISODIUM EDETATE 15-25 MG/KG
(0.08-0.125 ML OF 20% SOLN PER KG BODY WT) IN 250-500 ML OF (ING
18)
RTECS #:9999999ZZ

Ingred Name:ING 17: 5% DEXTROSE INTRAVENOUSLY OVER 1-2 HR PERIOD TWICE
DAILY. MAX DOSE SHOULD NOT EXCEED 50 MG/KG/DAY. DRUG (ING 19)
RTECS #:9999999ZZ

Ingred Name:ING 18: SHOULD BE GIVEN IN 5-DAY COURSES W/REST PERIOD OF
AT LEAST 2 DAYS BETWEEN COURSES. AFTER FIRST COURSE, (ING 20)
RTECS #:9999999ZZ

Ingred Name:COPPER (II) CARBONATE HYDROXIDE/CUPRIC CARBONATE, BASIC
LD50 (ORAL RAT): 1350 MG/KG
CAS:12069-69-1
RTECS #:GL6910000
Fraction by Wt: 100%

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OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name: SUP DAT: ANURIA W/RENAL NECROSIS MAY OCCUR IN 24-48 HRS DUE TO INTRAVASCULAR HEMOLYSIS. JAUN W/SOMETIMES (ING 3)
RTECS #: 9999999Z

Ingred Name: ING 2: PROGRESSIVE HEPATIC NECROSIS MAY OCCUR IN 2-3 DAYS. DEATH MAY BE PRECEDED BY CONVLS, PARAL/COMA. EARLY (ING 4)
RTECS #: 9999999Z

Ingred Name: ING 3: DEATH RSLTS FROM SHOCK & LATE DEATH FROM LIVER/KIDNEY FAILURE. GEN SOL IONIZED COPPER SALTS ARE MORE TOX (ING 5)
RTECS #: 9999999Z

Ingred Name: ING 4: THAN INSOL/SLIGHTLY DISSOCIATED COPPER SALTS. THEREFORE, EFTS OF EXPOS TO CUPRIC CARBONATE MAY BE LIM TO (ING 6)
RTECS #: 9999999Z

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

LD50 LC50 Mixture: SEE INGREDIENT 1.
Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES
Reports of Carcinogenicity: NTP: NO IARC: NO OSHA: NO
Health Hazards Acute and Chronic: ACUTE: INHAL: COPPER DUSTS MAY IRRITATE RESP TRACT CAUSING SORE THROAT, COUGH, SHORTNESS OF BRTH, HDCH & POSS ULCERATION/PERFORATION OF NASAL SEPTUM. SKIN: MAY CAUSE IRRIT, REDNESS & PAIN. EYES: EXPOSTO COPPER SALTS HAS CAUSED CONJ, PAIN, BLURRED VISION, ULCERATION, TURBIDITY & POSS PALPEBRAL EDEMA. (EFTS OF OVEREXP)
Explanation of Carcinogenicity: NOT RELEVANT.
Effects of Overexposure: HLTH HAZ: PARTICLES OF VERDIGRIS (MIX OF CUPRIC CARBONATE & COPPER OXIDES) PRDCED IMMED IRRIT & CONJ INFLAMM WHICH SUBSIDES AFTER CLEANSING. INGEST: VOMIT & COLLAPSE ARE PRINCIPAL EFTS OF METAL SALTS, W/POSS TENESMUS, RETCHING, HEMOLYSIS, HEMATURIA, ANURIA, LIVER DMG W/JAUN, HYPOTENSION & CONVLS. OBJECTIONABLE (SUP DAT)
Medical Cond Aggravated by Exposure: NONE SPECIFIED BY MANUFACTURER.

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

First Aid: INHAL: REMOVE TO FRESH AIR IMMED. IF BRTHG STOPPED, PERFORM ARTF RESP. KEEP WARM & AT REST. TREAT SYMPTOMATICALLY & SUPPORTIVELY. GET MED ATTN IMMED. SKIN: REMOVE CONTAM CLTHG & SHOES IMMED. WASH AFFE CTED AREA W/SOAP/MILD DETERGENT & LGE AMTS OF WATER UNTIL NO EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MED ATTN IMMED. EYES: WASH IMMED W/LGE AMTS OF WATER, OCCAS LIFTING UPPER & LOWER (ING 13)

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

Flash Point: NON-COMBUSTIBLE
Extinguishing Media: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY/REGULAR FOAM. FOR LARGER FIRES, USE WATER SPRAY, FOG/REGULAR FOAM.
Fire Fighting Procedures: WEAR NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIP. NO ACUTE HAZARD. MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. AVOID BREATHING VAPORS/DUSTS; KEEP UPWIND.

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Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

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

Spill Release Procedures:NO SPECIAL PRECAUTIONS INDICATED.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:NONE SPECIFIED BY MANUFACTURER.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

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

Respiratory Protection:USE NIOSH APPROVED RESPIRATORS. TO 1000 MG/M3 (TOTAL DUST): HIGH EFFICIENCY PARTICULATE FILTER WITH FULL FACEPIECE. 10,000 MG/M3 (TOTAL DUST): SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE, HELMET/HOOD; SCBA WITH FULL FACEPIECE.

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:EMERGENCY EYEWASH AND DELUGE SHOWER MEETING ANSI DESIGN CRITERIA . WEAR APPROPRIATE PROTECTIVE CLOTHING.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

EFTS OF OVEREXP: TASTE IS A WARNING TO LIM EXPOS TO COPPER WHICH IS RARELY SEV IF PROMPTLY REMOVED BY EMESIS. COPPER IS AN ESSENTIAL TRACE MINERAL, BUT IN TOX AMTS MAY CAUSE GREEN VOMITUS, SEV HDCH, C OLD SWEAT, WEAK PULSE, EARLY CNS EXCITATION FOLLOWED BY DEPRESS, WIDESPREAD CAPILLARY DMG & CIRCULATORY SHOCK. (ING 2)

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

Melt/Freeze Pt:M.P/F.P Text:392F,200C

Spec Gravity:4.0

Solubility in Water:INSOLUBLE

Appearance and Odor:GREEN TO BLUE AMORPHOUS POWDER OR DARK-GREEN MONOCLINIC CRYSTALS

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

Stability Indicator/Materials to Avoid:YES

COPPER IONS CATALYZE THE VIGOROUS DECOMPOSITION OF SODIUM HYPOBROMITE.

Stability Condition to Avoid:STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

Hazardous Decomposition Products:NONE SPECIFIED BY MANUFACTURER.

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

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS .

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Material Safety Data Sheet
Cupric Chloride, 0.1000 M Solution

ACC# 88018

Section 1 - Chemical Product and Company Identification

MSDS Name: Cupric Chloride, 0.1000 M Solution

Catalog Numbers: M-020, M020, MCC-020, MCC030275

Synonyms: Copper Chloride Aqueous Solution; Copper(II) Chloride; Kirticopper.

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7447-39-4	Cupric chloride	1.71 %	231-210-2
7732-18-5	Water	Balance	231-791-2

Hazard Symbols: None listed.

Risk Phrases: None listed.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light blue liquid. **Warning!** May cause severe eye irritation and possible injury. May cause skin irritation. May cause respiratory and digestive tract irritation.

Target Organs: Blood, liver, lungs.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: May cause skin irritation.

Ingestion: May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

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Chronic: Chronic ingestion may cause liver damage. Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration.

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 or keep eyes closed.

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: 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: 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. 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. Remove contaminated clothing and wash before reuse. Use

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with adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Discard contaminated shoes.

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

Section 8 - Exposure Controls, Personal Protection

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cupric chloride	none listed	none listed	none listed
Water	none listed	none listed	none listed

OSHA Vacated PELs: Cupric chloride: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

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

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: light blue

Odor: odorless

pH: 3.2 (0.2 M solution)

Vapor Pressure: 14 mm Hg

Vapor Density: 0.7

Evaporation Rate: >1

Viscosity: Not available.

Boiling Point: > 100 deg C

Freezing/Melting Point: < 0 deg C

Decomposition Temperature: 300 deg C

Solubility: Soluble in water

Specific Gravity/Density: 3.0-3.8

Molecular Formula: CuCl₂

Molecular Weight: 134.452

Section 10 - Stability and Reactivity

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Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, moisture, temperatures above 300°C.

Incompatibilities with Other Materials: Strong acids; alkali metals; potassium; sodium; acetylene

Hazardous Decomposition Products: Hydrogen chloride, chloride fumes.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7447-39-4: GL7000000

CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 7447-39-4:

Oral, mouse: LD50 = 233 mg/kg;

Oral, rat: LD50 = 584 mg/kg;

Oral, rat: LD50 = 140 mg/kg; <BR.

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg; <BR.

Carcinogenicity:

CAS# 7447-39-4: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

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

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7447-39-4 is listed on the TSCA inventory.

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

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 7447-39-4: 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 # 7447-39-4: acute, chronic.

Section 313

This material contains Cupric chloride (listed as Copper), 1 71%, (CAS# 7447-39-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7447-39-4 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

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OSHA:

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

STATE

CAS# 7447-39-4 can be found on the following state right to know lists: California, Pennsylvania, Massachusetts.

CAS# 7732-18-5 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:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7447-39-4: 2

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

Canada - DSL/NDSL

CAS# 7447-39-4 is listed on Canada's DSL List.

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

Canada - WHMIS

WHMIS: Not available.

Canadian Ingredient Disclosure List

CAS# 7447-39-4 (listed as Copper) is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 7447-39-4: OEL-ARAB Republic of Egypt: TWA 0.1 mg(Cu)/m³ (fume)
OEL-AUSTRALIA: TWA 0.2 mg(Cu)/m³ (fume) OEL-AUSTRALIA: TWA 1 mg(Cu)/m³
(dust) OEL-BELGIUM: TWA 0.2 mg(Cu)/m³ (fume) OEL-BELGIUM: TWA 1 mg(Cu)
) /m³ (dust) OEL-DENMARK: TWA 0.1 mg(Cu)/m³ (fume) OEL-DENMARK: TWA 1 m
g(Cu)/m³ (dust) OEL-FINLAND: TWA 0.2 mg(Cu)/m³ (fume) OEL-FINLAND: TWA
1 mg(Cu)/m³ OEL-FINLAND: TWA 1 mg(Cu)/m³ (dust) OEL-FRANCE: TWA 0.2 m
g(Cu)/m³ (fume) OEL-FRANCE: TWA 1 mg(Cu)/m³; STEL 2 mg(Cu)/m³ (dust OE
L-GERMANY: TWA 0.1 mg(Cu)/m³ (fume) OEL-GERMANY: TWA 1 mg(Cu)/m³ OEL-G
ERMANY: TWA 1 mg(Cu)/m³ (dust) OEL-HUNGARY: TWA 0.2 mg(Cu)/m³; STEL 0.4
mg(Cu)/m³ (dust) OEL-INDIA: TWA 0.2 mg(Cu)/m³ (fume) OEL-THE NETHERLA
NDS: TWA 0.2 mg(Cu)/m³ (fume) OEL-THE NETHERLANDS: TWA 1 mg(Cu)/m³ (dust
) OEL-THE PHILIPPINES: TWA 1.0 mg(Cu)/m³ (fume) JAN9 OEL-POLAND: TWA 0
.1 mg(Cu)/m³ (fume) OEL-RUSSIA: STEL 0.5 ppm (1 mg(Cu)/m³) (dust) JAN9
OEL-SWEDEN: TWA 0.2 mg(Cu)/m³ (resp. dust) OEL-SWEDEN: TWA 0.2 mg(Cu)
/m³ (fume) OEL-SWEDEN: TWA 1 mg(Cu)/m³ (total dust) OEL-SWITZERLAND: T
WA 0.1 mg(Cu)/m³; STEL 0.2 mg(Cu)/m³ (fume) OEL-SWITZERLAND: TWA 1 mg(C
u)/m³; STEL 1 mg(Cu)/m³ OEL-THAILAND: TWA 0.1 mg(Cu)/m³ (fume) OEL-THA
ILAND: TWA 1 mg(Cu)/m³ OEL-U

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SIGMA CHEMICAL CO -- CUPRIC CHLORIDE DIHYDRATE ACS REAGENT, C6917 -- 6810-00N092608

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

Product ID:CUPRIC CHLORIDE DIHYDRATE ACS REAGENT, C6917

MSDS Date:01/01/1999

FSC:6810

NIIN:00N092608

Status Code:A

MSDS Number: CJTRC

=== Responsible Party ===

Company Name:SIGMA CHEMICAL CO

Box:14508

City:ST LOUIS

State:MO

ZIP:63178

Country:US

Info Phone Num:314-771-5765

Emergency Phone Num:314-771-5765

CAGE:21076

=== Contractor Identification ===

Company Name:SIGMA CHEMICAL COMPANY

Address:3050 SPRUCE ST

Box:14508

City:ST LOUIS

State:MO

ZIP:63178

Country:US

Phone:314-771-5765

CAGE:21076

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

Ingred Name:COPPER CHLORIDE DIHYDRATE

CAS:10125-13-0

RTECS #:GL7030000

= Wt:100.

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

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE: HARMFUL IF INHALED OR

SWALLOWED. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. CAUSES SEVERE EYE IRRITATION. CAUSES SKIN IRRITATION. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. DEPENDING ON THE INTENSITY AND DURATION OF EXPOSURE, EFFECTS MAY VARY FROM MILD IRRITATION TO SEVERE DESTRUCTION OF TISSUE. SYMPTOMS OF SYSTEMIC COPPER POISONING MAY INCLUDE: CAPILLARY DAMAGE, HEADACHE, COLD SWEAT, WEAK PULSE, KIDNEY AND LIVER DAMAGE, CENTRAL NERVOUS SYSTEM EXCITATION FOLLOWED BY DEPRESSION, JAUNDICE, CONVULSIONS, PARALYSIS AND COMA. DEATH MAY OCCUR FROM SHOCK OR RENAL FAILURE.

CHRONIC:TARGET (EFTS OF OVEREXP)

Effects of Overexposure:HLTH HAZS: ORGANS(S): LIVER, KIDNEYS, LUNGS,

NERVES. ADDITIONAL INFORMATION: CHRONIC COPPER POISONING IS TYPIFIED BY HEPATIC CIRRHOSIS, BRAIN DAMAGE AND DEMYELINATION, KIDNEY DEFECTS, AND COPPER DEPOSITION IN THE CORNEA AS EXEMPLIFIED BY HUMANS WITH WILSON'S DISEASE. IT HAS ALSO BEEN REPORTED THAT COPPER POISONING HAS LEAD TO HEMOLYTIC ANEMIA AND ACCELERATES

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ARTERIOSCLEROSIS.

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

First Aid: EYES: IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN: IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. WASH CONTAMINATED CLOTHING BEFORE REUSE. INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGESTION: WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL MD.

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

Extinguishing Media: NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.
Fire Fighting Procedures: USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT.
Unusual Fire/Explosion Hazard: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

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

Spill Release Procedures: WEAR NIOSH APPROVED RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

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

Handling and Storage Precautions: DO NOT BREATHE DUST. DO NOT GET IN EYES, ON SKIN, ON CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE. KEEP TIGHTLY CLOSED. STORE IN A COOL, DRY PLACE.
Other Precautions: TOXIC (U.S.A.). HARMFUL (EU). RISK OF SERIOUS DAMAGE TO EYES. CAUTION: SUBSTANCE NOT YET FULLY TESTED.

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

Respiratory Protection: WEAR APPROPRIATE NIOSH APPROVED RESPIRATOR.
Ventilation: MECHANICAL EXHAUST REQUIRED.
Protective Gloves: CHEMICAL-RESISTANT GLOVES.
Eye Protection: ANSI APPROVED CHEMICAL WORKERS GOGGLES AND FULL LENGTH FACESHIELD.
Other Protective Equipment: EYE WASH & DELUGE SHOWER MEETING ANSI DESIGN CRITERIA. WEAR SUITABLE OTHER PROTECTIVE CLOTHING.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Supplemental Safety and Health
MSDS INFORMATION ON INGREDIENTS: MOLECULAR FORMULA: CL₂CU.

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

Boiling Pt: B.P. Text: N/P
Vapor Density: >1
Spec Gravity: 2.510
Appearance and Odor: BLUE-GREEN CRYSTALS.

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

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Stability Indicator/Materials to Avoid: YES

COPPER (II) CHLORIDE REACTS VIOLENTLY WITH POTASSIUM, SODIUM. CONTACT WITH ACETYLENE MAY CAUSE FORMATION OF COPPER ACETYLIDES THAT ARE SHOCK-SENSITIVE. AVOID ALKALI METALS.

Stability Condition to Avoid: AVOID HEAT AND MOISTURE. PROTECT FROM MOISTURE.

Hazardous Decomposition Products: TOXIC FUMES OF: HYDROGEN CHLORIDE GAS.

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

Toxicological Information: TO THE BEST OF MFR'S KNOWLEDGE, THE CHEMICAL, PHYSICAL AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED. ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

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

Ecological: DATA NOT YET AVAILABLE.

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

Waste Disposal Methods: CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF THIS MATERIAL. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

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

Transport Information: CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

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

SARA Title III Information: THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS - COPPER COMPOUNDS.

Federal Regulatory Information: EUROPEAN INFORMATION: CAUTION: SUBSTANCE NOT YET FULLY TESTED. HARMFUL. R 20/22 - HARMFUL BY INHALATION AND IF SWALLOWED. R 36/37/38 - IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN. R 41 - RISK OF SERIOUS DAMAGE TO EYES. S 26 - IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE. S 36 - WEAR SUITABLE PROTECTIVE CLOTHING. REVIEWS, STANDARDS AND REGULATIONS : OEL=MAK. EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION - FEREAC 54,7740,1989 .

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

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FISHER SCIENTIFIC -- CUPRIC OXIDE -- 6810-00-300-6193

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

Product ID:CUPRIC OXIDE
MSDS Date:04/11/1991
FSC:6810
NIIN:00-300-6193
MSDS Number: BSYH
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
CAGE:1B464

==== Contractor Identification ====
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

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

Ingred Name:COPPER OXIDE (CUPRIC OXIDE)
CAS:1317-38-0
RTECS #:GL7900000
Fraction by Wt: 100%
OSHA PEL:1 MG/M3 FUME (CU)
ACGIH TLV:1 MG/M3 FUME (CU)

Ingred Name:SUPP DATA:HAS RSLTD IN IRRIT, NECROSIS, & GREENISH SKIN
DISCOLORATION. ALLERGIC CNTCT DERM, ALTHOUGH RARE, HAS (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2:BEEN REPORTED. EYE:ACUTE:CNTCT MAY CAUSE IRRIT. SOME
COPPER SALTS HAVE BEEN REPORTED TO CAUSE CONJUNC, (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:CORNEAL ULCERATIONS, & TURBIDITY POSS W/PALPEBRAL
EDEMA. COPPER PARTICLES EMBEDDED IN EYE MAY RESULT IN (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4: A PRONOUNCED FOREIGN-BODY RESPONSE W/CHRACTERISTIC
DISCOLORATION OF OCULAR TISSUE. CHRONIC: RPTD/PRLNGD (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:EXPOSURE TO IRRITANTS MAY CAUSE CONJUCTIVITIS.
INGEST: ACUTE:INGEST OF COPPER SALTS MAY CAUSE AN IMMED (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:METALLIC TASTE, SALIVATION, NAUSEA, EPIGASTRIC

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BURNING, VOMITING, DIARRHEA, ULCERS, HEMORRHAGIC GASTRITIS, (ING 8)
RTECS #:9999999ZZ

Ingrid Name:ING 7: ANURIA, COMA, CONVULSIONS AND DEATH. CHRONIC:
REPEATED OR PROLONGED EXPOSURE TO COPPER SALTS HAS PRODUCED(ING 9)
RTECS #:9999999ZZ

Ingrid Name:ING 8:HEMOLYTIC ANEMIA AND LIVER, KIDNEY, AND SPLEEN DAMAGE
IN ANIMALS.
RTECS #:9999999ZZ

Ingrid Name:FIRST AID PROC: WATER OR NORMAL SALINE SOLN FOR AT LEAST 15
MIN, OCCASIONALLY LIFTING UPPER & LOWER LIDS, UNTIL (ING 11)
RTECS #:9999999ZZ

Ingrid 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

Ingrid Name:ING 11: AMTS OF WATER OR MILK AND REMOVE BY GASTRIC LAVAGE
UNLESS THE VICTIM IS ALREADY VOMITING. (DREISBACH, (ING 13)
RTECS #:9999999ZZ

Ingrid Name:ING 12:HANDBOOK OF POISONING, 12TH ED).GET MED ATTN IMMED.
ADMIN OF GASTRIC LAVAGE SHLD BE PERFORMED BY QUALIFIED(ING14)
RTECS #:9999999ZZ

Ingrid Name:ING 13: MEDICAL PERSONNEL. ANTIDOTE: THE FOLLOWING ANTIDOTE
HAS BEEN RECOMMENDED. HOWEVER, THE DECISION AS TO (ING 15)
RTECS #:9999999ZZ

Ingrid Name:ING 14: WHETHER THE SEVERITY OF POISONING REQUIRES
ADMINISTRATION OF ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHLD (ING
16)
RTECS #:9999999ZZ

Ingrid 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

Ingrid 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

Ingrid 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

Ingrid Name:ING 18:DAYS BETWEEN COURSES. AFTER THE FIRST COURSE,
SUBSEQUENT COURSES SHLD NOT EXCEED 50 MG/KG/DAY. DAILY (ING 20)
RTECS #:9999999ZZ

Ingrid Name:ING 19: URINALYSES SHOULD NOT BE DONE DURING TREATMENT
PERIOD. DOSAGE SHOULD BE REDUCED IF ANY UNUSUAL URINARY (ING 21)
RTECS #:9999999ZZ

Ingrid Name:ING 20:FINDINGS APPEAR. IV ADMIN IS CONTRAINDICATED IN
PRESENCE OF ELEV CEREBROSPINAL FLUID PRESS. PENICILLAMINE(ING 22)

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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 =====

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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-EFFICIE NCY 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 APPRVD CHEM SAFETY GOGGLES .

Other Protective Equipment:EMERGENCY EYEWASH FOUNTAIN.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

MATLS TO AVOID:HYDROGEN SULFIDE, HYDROGEN TRISULFIDE, HYDROXYLAMINE, MAGNESIUM, PHOSPHAM, PHTHALIC ANHYDRIDE, POTASSIUM, RUBIDIUM ACETYLIDE & ACETYLENE CARBIDE, SODIUM, TITANIUM, ZIRCONIUM. EFTS OF OV EREXP:PAPULOVESICULLAR, SKIN DISCOLORATION & ECZEMATOID LESIONS.
CHRONIC: RPTD/PRLNGD CNTCT W/SOME COPPER SALTS (ING 2)

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

Melt/Freeze Pt:M.P/F.P Text:2419F,1326C

Spec Gravity:6.3-6.49

Solubility in Water:INSOLUBLE

Appearance and Odor:BLACK TO BROWNISH-BLACK CRYSTALS OR POWDER.

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

ALUMINUM, ANILINIUM PERCHLORATE, BORON, CESIUM ACETYLENE CARBIDE, DICHLOROMETHYLSILANE, HYDRAZINE, HYDROGEN, (SUPP DATA)

Stability Condition to Avoid:NONE REPORTED.

Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE TOXIC AND/OR HAZARDOUS GASES.

==== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

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FISHER SCIENTIFIC -- CUPRIC SULFATE -- 6810-00F007249

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

Product ID:CUPRIC SULFATE

MSDS Date:01/01/1987

FSC:6810

NIIN:00F007249

MSDS Number: BXNN

==== Responsible Party ====

Company Name:FISHER SCIENTIFIC/FAIR LAWN, NJ 07410

Emergency Phone Num:(201) 796-7100

CAGE:1B464

==== Contractor Identification ====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV

Address:1 REAGENT LANE

Box:City:FAIRLAWN

State:NJ

ZIP:07410-2802

Country:US

Phone:201-796-7100

CAGE:1B464

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

Ingred Name:CUPRIC SULFATE (SARA III)

CAS:7758-98-7

RTECS #:GL8800000

Fraction by Wt: 100%

OSHA PEL:1 MG CU/M3

ACGIH TLV:1 MG/M3

EPA Rpt Qty:10 LBS

DOT Rpt Qty:10 LBS

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

Effects of Overexposure:IRRITATION OF THE NASAL MUCOUS MEMBRANES, EYE & CONJUNCTIVITIS, LIVER, KIDNEY DAMAGE, VOMITING.

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

First Aid:INHALATION: REMOVE TO FRESH AIR. SKIN: REMOVE CONTAMINATED CLOTHING/SHOES. WASH AFFECTED AREAS W/SOAP/MILK DETERGENT/WATER. EYES: WASH W/WATER 20 MINS. INGESTION: IF CONSCIOUS, GIVE 2 TO 4 GLASSES OF WATER, & INDUCE VOMITING. GET MEDICAL ATTENTION.

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

Flash Point:NON-FLAMMABLE

Extinguishing Media:DRY CHEMICAL, WATER FOG OR ALCOHOL FOAM.

Fire Fighting Procedures:SCBA W/FULL FACEPIECE IN PRESSURE-DEM AND.

Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE/EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME.

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

Spill Release Procedures:DON'T TOUCH SPILLED MATERIAL. FOR SMALL SPILLS, TAKE UP W/SAND OR OTHER ABSORBENT MARIA/PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR SMALL DRY SPILLS, W/CLN SHOVEL

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PLACE MATERIAL INTO CLEAN, DRY CONTAINER & COVER. MOVE FROM SPI AREA.

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

Respiratory Protection:HIGH LEVELS: SCBA W/FULL FACEPIECE, HELMET, OR HOOD.

Ventilation:PROVIDE LOCAL EXHAUST VENTILATION TO KEEP 200C

Spec Gravity:3.6

Solubility in Water:12.5%

Appearance and Odor:GRAYISH-WHITE TO GREENISH-WHITE RHOMBIC CRYSTALS

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

Stability Indicator/Materials to Avoid:YES

HYDROXYLAMINE, SODIUM HYPOBROMITE, MAGNESIUM, .

Stability Condition to Avoid:AVOID THERMAL DECOMPOSITION AT 650C FOR ANHYDROUS.

Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS INCLUDE TOXIC GASES.

Conditions to Avoid Polymerization:AVOID CONTACT/STORAGE WITH SUBSTANCE IN THE REACTIVITY SEC.

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FISHER SCIENTIFIC, CHEMICAL DIV. -- EDTA, DISODIUM SALT -- 6810-00-926-4771

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

Product ID:EDTA, DISODIUM SALT
MSDS Date:05/31/1990
FSC:6810
NIIN:00-926-4771
MSDS Number: BJFQD
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
CAGE:1B464
=== Contractor Identification ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

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

Ingred Name:ETHYLENEDIAMINETETRAACETIC ACID, DISODIUM SALT
CAS:139-33-3
RTECS #:AH4375000
Fraction by Wt: 100%

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

LD50 LC50 Mixture:LD50:(ORAL) 2000MG/KG(RAT)
Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHAL: NO SPECIFIC DATA AVAIL.INHAL OF
DUSTS OR MISTS OF EDTA SALTS MAY CAUSE MUC MEMB IRRIT W/SORE
THROAT&COUGHING.SKIN: ACUTE:NO SPEC DATA AVAIL. EDTA SALTS MAY
CAUSE IRRIT W/REDNESS&PAIN. RPTD OR P RLNGD CONT W/EDTA SALTS MAY
CAUSE MOD IRRIT & POSS MILD BURN.EYE:CONT W/EDTA SALTS MAY CAUSE
IRRIT W/REDNESS&PAIN.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HEALTH HAZARDS (CONT) SOLN OF EDTA SALTS ARE
EXTREMELY IRRIT TO GI SYSTEM. IF ENOUGH MATL SWALLOWED MAY RESULT
IN SYSTEMIC TOXICITY. MATL MAY CHELATE LEAD, MAGNESIUM, ZINC, AND
TRACE METALS IF PRESEN T IN THE INTESTINE POSSIBLY INCREASING
TOTAL BODY STORES OF THESE METALS.
Medical Cond Aggravated by Exposure:PERSONS W/RENAL OR HEART DISEASE;
HISTORY OF SEIZURES OR INTERCRANIAL LESIONS; POTASSIUM DEFICIENCY;
OR INSULIN DEPENDENT DIABETES ARE AT INCREASED RISK OF EXPOSURE.

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

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First Aid:INHAL:REMOVE FROM EXPOS TO FRESH AIR IMMED. SUPPORT BREATH (O*2/ARTIFICIAL RESPIRATION) KEEP WARM. SEE MD. SKIN: REMOVE CONTAM CLTH. WASH AFFECTED AREA WITH SOAP AND WATER FOR 15 MIN. SEE MD. EYE: F LUSH EYE IMMED W/WATER FOR 15 MIN. SEE MD. INGEST: SEE MD IMMED. TREAT SYMPTOMATICALLY. IF VOMIT, PREVENT ASPIRATION.

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

Extinguishing Media:DRY CHEM, CARBON DIOXIDE, HALON, WATER SPRAY OR STANDARD FOAM. FOR LARGER FIRES USE WATER SPRAY, FOG OR STANDARD FOAM.

Fire Fighting Procedures:MOVE CNTNR FROM FIRE AREAS.DO NOT SCATTER SPILLD MATL W/HIGH PRESS H*2O STREAMS.DIKE FIRE CONTROL H*2O FOR LATER DISP.USE NIOSH/MSHA APPRVD SCBA&FULL PROT EQUIP

Unusual Fire/Explosion Hazard:SLIGHT FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

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

Spill Release Procedures:SWEEP UP AND PLACE IN SUITABLE CLEAN, DRY CONTR FOR RECLAMATION OR LATER DISPOSAL. DO NOT FLUSH SPILLED MATERIAL INTO SEWER. KEEP UNNECESSARY PEOPLE AWAY.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:STORE AWAY FORM INCOMPATIBLE SUBSTANCES. KEEP IN A TIGHTLY CLOSED CONTAINER, STORE IN A COOL, DRY VENTILATED AREA.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

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

Respiratory Protection:NIOSH/MSHA APPRVD DUST/MIST RESP W/FULL FACEPIECE.AIR PURIFYING FULL FACEPIECE RESP W/HEPA FILTER.POWERED AIR PURIFYING RESP W/TIGHT FITTING FACEPIECE&HEPA FILTER.TYPE C, SUPP AIR RESP OPER IN PRESS D EMAND MODE W/FULL FP,HELM,OR HOOD.SCBA.

Ventilation:PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION SYSTEM.

Protective Gloves:CHEMICAL WORKERS GLOVES

Eye Protection:CHEMICAL WORKERS GOGGLES

Other Protective Equipment:IMPERVIOUS CLTH&EQUIP TO PREVENT RPTD&PRLNGD SKIN CONT W/MATL. EMERGENCY EYE WASH.

Work Hygienic Practices:SEE OTHER PROTECTIVE EQUIPMENT.

Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

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

Melt/Freeze Pt:M.P/F.P Text:482F,250C

Decomp Temp:Decomp Text:482F,250C

Vapor Pres:NEGLIGIBLE

pH:4-6

Solubility in Water:SOLUBLE @5% SOLN

Appearance and Odor:HYGROSCOPIC, WHITE CRYSTALLINE POWDER

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

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Stability Indicator/Materials to Avoid: YES
STRONG OXIDIZING MATERIALS.

Stability Condition to Avoid: MAY BURN BUT DOES NOT IGNITE READILY. AVOID
CONT W/STRONG OXIDIZERS, EXCESS HEAT, SPARKS, OR OPEN FLAME.

Hazardous Decomposition Products: THERMAL DECOMP PROD MAY INCLUDE TOXIC
AND HAZARDOUS OXIDES OF CARBON, NITROGEN, AND SODIUM.

===== 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 EPA.

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particular situation.

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SPECTRUM CHEMICAL MFG. CORP. -- F3150, FERRIC SUBSULFATE -- -

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

Product ID:F3150, FERRIC SUBSULFATE

MSDS Date:12/17/1996

FSC:NIIN:Submitter:D RV

Status Code:A

MSDS Number: CLNGD

=== Responsible Party ===

Company Name:SPECTRUM CHEMICAL MFG. CORP.

Address:14422 SOUTH SAN PEDRO STREET

City:GARDENA

State:CA

ZIP:90248-2027

Country:US

Info Phone Num:310-516-8000

Emergency Phone Num:(800)424-9300

Preparer's Name:E. BRULL

Chemtrec Ind/Phone:(800)424-9300

CAGE:63415

=== Contractor Identification ===

Company Name:SPECTRUM LABORATORY PRODUCTS INC

Address:14422 S SAN PEDRO ST

Box:City:GARDENA

State:CA

ZIP:90248-2027

Country:US

Phone:310-516-8000/FAX: 310-516-9843

CAGE:63415

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

Ingred Name:FERRIC SUBSULFATE

CAS:1310-45-8

= Wt:100.

Other REC Limits:TWA: 1 MG/M3

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

Routes of Entry: Inhalation:UNKNOWN Skin:UNKNOWN Ingestion:YES
Health Hazards Acute and Chronic:THIS SUBSTANCE IS TOXIC TO BLOOD,
KIDNEYS, LIVER. SLIGHTLY DANGEROUS TO DANGEROUS IN CASE OF
INGESTION. VERY SLIGHTLY TO SLIGHTLY DANGEROUS IN CASE OF EYE
CONTACT (IRRITANT), OF INHALATION. CHRONIC: V ERY SLIGHTLY TO
SLIGHTLY DANGEROUS IN CASE OF EYE CONTACT (IRRITANT), OF
INHALATION.REPEATED OR PROLONGED EXPOSURE TO THE SUBSTANCE CAN
PRODUCE TARGET ORGAN DAMAGE.

Effects of Overexposure:SLIGHTLY DANGEROUS TO DANGEROUS IN CASE OF
INGESTION. VERY SLIGHTLY TO SLIGHTLY DANGEROUS IN CASE OF EYE
CONTACT (IRRITANT), OF INHALATION. CHRONIC: VERY SLIGHTLY TO
SLIGHTLY DANGEROUS IN CASE OF EYE CONTACT (IRRITANT), OF
INHALATION. REPEATED OR PROLONGED EXPOSURE TO THE SUBSTANCE CAN
PRODUCE TARGET ORGANS DAMAGE.

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

First Aid:EYE: IMMEDIATELY FLUSH EYES WITH RUNNING WATER FOR AT LEAST
15 MINUTES, KEEPING EYELIDS OPEN. COLDWATER MAY BE USED. SKIN: NO

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KNOWN EFFECT ACCORDING TO OUR DATABASE. INHALATION: ALLOW THE VICTIM TO REST IN A WELL VENTILATED AREA. SEEK IMMEDIATE MEDICAL ATTENTION. INGESTION: REMOVE DENTURES IF ANY. HAVE CONSCIOUS PERSON DRINK SEVERAL GLASSES OF WATER OR MILK. INDUCE VOMITING BY STICKING FINGER IN THROAT. LOWER THE HEAD SO THAT THE VOMIT WILL NOT REENTER THE MOUTH AND THROAT. NEVER GIVE AN UNCONSCIOUS PERSON ANYTHING TO INGEST. SEEK MEDICAL ATTENTION.

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

Flash Point:NA
Autoignition Temp:Autoignition Temp Text:NA
Lower Limits:NA
Upper Limits:NA
Extinguishing Media:NON-FLAMMABLE
Fire Fighting Procedures:NON-FLAMMABLE
Unusual Fire/Explosion Hazard:NO SPECIFIC INFORMATION IS AVAILABLE IN OUR DATABASE REGARDING THE PRODUCT'S RISK OF EXPLOSION IN THE PRESENCE OF VARIOUS MATERIALS.

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

Spill Release Procedures:USE APPROPRIATE TOOLS TO PUT THE SPILLED SOLID IN A CONVENIENT WASTE DISPOSAL CONTAINER. IF NECESSARY: NEUTRALIZE THE RESIDUE WITH A DILUTE SOLUTION OF SODIUM CARBONATE. FINISH CLEANING BY SPREADING WATER ON THE CONTAMINATED SURFACE AND DISPOSE OF ACCORDING TO LOCAL AND REGIONAL AUTHORITY REQUIREMENTS.FOR LARGE SPILL, USE A SHOVEL TO PUT THE MATERIAL IN A CONVENIENT WASTE DISPOSAL CONTAINER.
Neutralizing Agent:SODIUM CARBONATE

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

Handling and Storage Precautions:NO SPECIFIC SAFETY PHRASE HAS BEEN FOUND APPLICABLE FOR THIS PRODUCT. NO SPECIFIC STORAGE IS REQUIRED. USE SHELVES OR CABINETS STURDY ENOUGH TO BEAR THE WEIGHT OF THE CHEMICALS. BE SURE THAT IT IS NOT NECESSARY TO STRAIN TO REACH MATERIALS, AND THAT SHELVES ARE NOT OVERLOADED.

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

Respiratory Protection:USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO KEEP AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. IF USER OPERATIONS GENERATE DUST, FUME OR MIST, USE VENTILATION TO KEEP EXPOSURE AIRBORNE CONTAMINANTS BELOW THE EXPOSURE LIMIT.
Ventilation:USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO KEEP AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS.
Protective Gloves:YES
Eye Protection:SPLASH GOGGLES, SAFETY GLASSES
Other Protective Equipment:LAB COAT, FULL SUIT, BOOTS. SUGGESTED PROTECTIVE CLOTHING MIGHT NOT BE SUFFICIENT, CONSULT A SPECIALIST BEFORE HANDLING THIS PRODUCT.
Work Hygienic Practices:WASH THOROUGHLY BEFORE EATING/DRINKING/SMOKING & AT END OF WORKDAY.
Supplemental Safety and Health

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

HCC:T6
Boiling Pt:B.P. Text:NA
Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES
Vapor Pres:NA
Vapor Density:NA
Spec Gravity:NA
pH:4
Viscosity:NA
Evaporation Rate & Reference:NA
Solubility in Water:EASILY SOLUBLE
Appearance and Odor:BROWN SOLID, STRONG TASTE, ODOR; NOT AVAILABLE.
Percent Volatiles by Volume:NA

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

Stability Indicator/Materials to Avoid:YES
NO SPECIFIC INFORMATION IS AVAILABLE IN OUR DATABASE REGARDING THE
REACTIVITY OF THIS MATERIAL IN PRESENCE OF VARIOUS OTHER MATERIALS.
Stability Condition to Avoid:NO ADDITIONAL REMARKS.
Conditions to Avoid Polymerization:WILL NOT OCCUR.

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

Toxicological Information:ROUTE OF ENTRY: INGESTION. CHRONIC EFFECTS TO
HUMANS; THE SUBSTANCE IS TOXIC TO BLOOD, KIDNEYS, LIVER, TOXICITY
OF THE PRODUCT TO THE REPRODUCTIVE SYSTEM: NOT AVAILABLE. OTHER
TOXIC EFFECTS ON HUMANS; SLIGHTLY DANGEROUS TO DANGEROUS IN CASE
OF INGESTION, VERY SLIGHTLY TO SLIGHTLY DANGEROUS IN CASE OF EYE
CONTACT (IRRITANT), OF INHALATION.

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

Ecological:NOT AVAILABLE

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

Waste Disposal Methods:RECYCLE TO PROCESS, IF POSSIBLE. CONSULT YOUR
LOCAL OR REGIONAL AUTHORITIES.

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

Transport Information:NOT A DOT CONTROLLED MATERIAL (UNITED STATES)

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

Federal Regulatory Information:THE FOLLOWING PRODUCT IS LISTED ON TSCA:
FERRIC SUBSULFATE. WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN
TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR BIRTH DEFECTS OR
OTHER REPRODUCTIVE HARM, CHEMICAL INGREDIENT REQUIRING THIS
WARNING: NONE.

State Regulatory Information:WARNING: THIS PRODUCT CONTAINS A CHEMICAL
KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR BIRTH DEFECTS
OR OTHER REPRODUCTIVE HARM, CHEMICAL INGREDIENT REQUIRING THIS
WARNING: NONE.

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

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FISHER SCIENTIFIC -- FERRIC AMMONIUM CITRATE, I 72500 -- 6810-00N027275

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

Product ID:FERRIC AMMONIUM CITRATE, I 72500

MSDS Date:02/21/1991

FSC:6810

NIIN:00N027275

MSDS Number: BNLSB

=== 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:ING 6: GET MED ATTN IMMED. INGEST: IN PATIENTS NOT IN SHOCK/COMA, INDUCE EMESIS W/SYRUP OF IPECAC IF VOMIT HAS (ING 8) RTECS #:9999999ZZ

Ingred Name:ING 7: NOT OCCURED. FOLLOW W/GASTRIC LAVAGE USING DEFEROXAMINE, 2 GRAMS IN 1 LTR OF H*2O CONTAINING SODIUM (ING 9) RTECS #:9999999ZZ

Ingred Name:ING 8:BICARBONATE, 20 G/L. LEAD 10 GRAMS OF DEFEROXAMINE IN 50 ML OF 5% SODIUM BICARBONATE IN STOMACH. MAINTAIN(ING 10) RTECS #:9999999ZZ

Ingred Name:ING 9: AIRWAY, BLOOD PRESS & RESP. TREAT SYMP & SUPPORTIVELY. GET MED ATTN IMMED. TREATMENT SHD BE ADMIN BY (ING 11) RTECS #:9999999ZZ

Ingred Name:ING 10:QUALIFIED MED PERSONNEL. ANTIDOTE: THE FOLLOWING ANTIDOTE HAS BEEN RECOM. HOWEVER, DECISION AS TO WHETHER(ING 12) RTECS #:9999999ZZ

Ingred Name:ING 11: SEVERITY OF POISONING REQS ADMIN OF ANY ANTIDOTE & ACTUAL DOSE REQD SHD BE MADE BY QUALIFIED MED (ING 13) RTECS #:9999999ZZ

Ingred Name:ING 12: PERSONNEL. IRON SALT POISONING: GIVE DEFEROXAMINE, 15 MG/KG/HOUR BY CONT IV INFUSION TO MAX OF 80 MG/KG (ING 14) RTECS #:9999999ZZ

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Ingred Name:ING 13: IN EACH 12-HOUR PERIOD. MONITOR BLOOD PRESS DURING
ADMIN OF DEFEROXAMINE & REDUCE RATE OF ADMIN IF BLOOD(ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14:PRESS FALLS. SINGLE DOSES SHD NOT EXCEED 1 GRAM &
MAX IN 24 HOURS SHD NOT EXCEED 6 GRAMS. DEFEROXAMINE IS(ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15:HAZ IN PATIENTS W/SEV RENAL DISEASE/ANURIA, &
DIALYSIS IS NEC. INJECTED DEFEROXAMINE IS ASSOCIATED W/HIGH(ING 17)
RTECS #:9999999ZZ

Ingred Name:ING 16: RISK & SHD BE RESERVED FOR SERIOUS POISONING. CONT
DEFEROXAMINE THERAPY UNTIL PATIENT IS FREE OF SYMP & (ING 18)
RTECS #:9999999ZZ

Ingred Name:ING 17: SIGNS FOR 24 HOURS. ANTIDOTE SHOULD BE ADMINISTERED
BY QUALIFIED MEDICAL PERSONNEL.
RTECS #:9999999ZZ

Ingred Name:CITRIC ACID, AMMONIUM IRON (3+) SALT; (FERRIC AMMONIUM
CITRATE) (SARA III)
CAS:1185-57-5
RTECS #:GE7540000
Fraction by Wt: 100%
OSHA PEL:1 MG/M3 (FE)
ACGIH TLV:1 MG/M3 (FE)
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

Ingred Name:SUPP DATA: APPARENT RECOVERY, PNEUM W/FEVER/SECONDARY SHOCK
MAY CAUSE DEATH 1-3 DAYS LATER. REVERSIBLE LIVER INJ (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2: MAY RSLT W/HEMORRHAGIC NECROSIS. AMONG SURVIVORS
PYLORIC STENOSIS & MILD HEPATIC CIRRHOSIS MAY BE (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3: ENCOUNTERED AS PERSISTENT SEQUELAE, BUT RECOVERY IS
USUALLY COMPLETE. (CHRONIC) INGEST: CHRONIC EXCESSIVE (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4: INTAKE OF SOLUBLE IRON SALTS MAY LEAD TO GEN INCR
IRON CONTENT IN BODY TISS SUCH AS LIVER.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC:SALINE, OCCASIONALLY LIFTING UPPER/LOWER
LIDS FOR AT LEAST 15 MIN, UNTIL EVIDENCE OF CHEM REMAINS.(ING 7)
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:(ACUTE) INHAL: DUSTS OF FERRIC SALTS
MAY CAUSE RESP TRACT IRRIT, COUGH & DYSPNEA. SKIN: CONT W/FERRIC

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SALTS MAY BE IRRIT. EYE: FERRIC SALTS MAY CAUSE REDNESS, PAIN, BLURRED VISION, & LACRIMATION. CORN EAL INJ & BURNS ARE POSS. INGEST: FERRIC AMMONIUM CITRATE IS USED IN TREATMENT OF ANEMIA. FERRIC SALTS (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT.

Effects of Overexposure:HLTH HAZ: MAY CAUSE SEV GASTRITIS W/ABDOMINAL PAIN, RETCHING, & PRLNGD VOMIT BEGINNING 10-60 MIN AFTER INGEST. VOMITUS MAY BE BLOODY. FERRIC IRON SALTS MAY CAUSE CORR DMG TO STOMACH & SMALL INTESTINES . VIOLENT DIARR MAY OCCUR W/DEHYDRATIONPOSS. CIRCULATORY SYS EFTS MAY OCCUR W/RAPID & SHALLOW RESP. DEATH (SUPP DATA)

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

First Aid:INHAL: REMOVE FROM EXPOS AREA TO FRESH AIR IMMED. IF BRTHG HAS STOPPED, PERFORM ARTF RESP. KEEP PERSON WARM & AT REST. TREAT SYMP & SUPPORTIVELY. GET MED ATTN IMMED. SKIN: REMOVE CONTAM CLTHG & SHOES IMMED. WASH AFFECTED AREA W/SOAP/MILD DETERGENT & LRG AMTS OF H*2O UNTIL NO EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MED ATTN IMMED. EYE: WASH EYES IMMED W/LRG AMTS OF H*2O/NORMAL (ING 6)

===== 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:WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP. MOVE CNTNR FROM FIRE AREA IF YOU CAN DO IT W/OUT 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:STOP LEAK IF YOU CAN DO IT WITHOUT RISK. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CLEAN, DRY CONTAINERS FOR LATER DISP. KEEP UNNEC PEOPLE AWAY. ISOLATE HAZARD ARE A AND DENY ENTRY.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:AVOID CONTACT WITH LIGHT AS DECOMPOSITION WILL OCCUR.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

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

Respiratory Protection:REFER TO ORIGINAL MSDS FOR FURTHER INFORMATION .

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:IMPERVIOUS CLOTHING AND EQUIPMENT, EMERGENCY EYE WASH

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

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Supplemental Safety and Health

APPEAR/ODOR: RED GRANULES/BROWNISH-YELLOW POWDER W/MILD FERRUGINOUS TASTE. FIRE FIGHT PROC: H*2O STREAMS. DIKE FIRE-CNTRL H*2O FOR LATER DISP. USE AGENTS SUITABLE FOR TYPE SURROUNDING FIRE. AVOID BRTH G HAZ VAPS/DUSTS, KEEP UPWIND. EFTS OF OVEREXP: MAY OCCUR FROM SHOCK IN USUALLY 4-5 HOURS. SOMETIMES FOLLOWING (ING 2)

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

HCC:T6

Boiling Pt:B.P. Text:DECOMPOSES

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

Solubility in Water:25%

Appearance and Odor:ODORLESS, HYDROSCOPIC GREEN TRANSPARENT,
DELIQUESCENT SCALES/PEARLS, (SUPP DATA

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

Stability Indicator/Materials to Avoid:YES

REFER TO ORIGINAL MSDS FOR FURTHER INFORMATION .

Stability Condition to Avoid:EXPOSURE TO LIGHT.

Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE
AMMONIA.

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

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH 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
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.

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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

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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 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# 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.

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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.

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FISHER SCIENTIFIC -- FERRIC CHLORIDE, HEXAHYDRATE -- 6810-00-299-8503

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

Product ID:FERRIC CHLORIDE, HEXAHYDRATE

MSDS Date:12/03/1990

FSC:6810

NIIN:00-299-8503

MSDS Number: BLTYC

=== 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:94480

=== Contractor Identification ===

Company Name:FISHER SCIENTIFIC COMPANY

Address:52 FADEM ROAD.DOMESTIC DIVISION

City:SPRINGFIELD

State:NJ

ZIP:07081

Country:US

Phone:201-796-7100

CAGE:94480

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

Ingred Name:IRON (3+) CHLORIDE, HEXAHYDRATE (FERRIC CHLORIDE,
HEXAHYDRATE)

CAS:10025-77-1

RTECS #:NO5425000

Fraction by Wt: 100%

OSHA PEL:1 MG(Fe)/M3

ACGIH TLV:1 MG(Fe)/M3

Ingred Name:MATLS TO AVOID:AROMATIC MONOMERS MAY CATALYZE VIOLENT
POLYMERIZATION. METALS:SOLUTION IS HIGHLY CORROSIVE.

RTECS #:9999999ZZ

Ingred Name:SUPP DATA:DEATH MAY OCCUR 1-3 DAYS LATER. AFTER 2 DAYS,
SURVIVORS MAY DEVELOP HEMORRHAGIC HEPATIC NECROSIS, (ING 4)

RTECS #:9999999ZZ

Ingred Name:ING 3:WHICH IS USUALLY REVERSIBLE. GASTRIC SCARRING &
CONTRACTURE & PYLORIC OBSTRUCTION MAY OCCUR AFTER 4 WEEKS. (ING 5)

RTECS #:9999999ZZ

Ingred Name:ING 4:PYLORIC STENOSIS & MILD HEPATIC CIRRHOSIS MAY
PERSIST. (CHRONIC) RPTD DOSAGE MAY CAUSE HEMOSIDEROSIS (ING 6)

RTECS #:9999999ZZ

Ingred Name:ING 5:W/POSSIBLE DAMAGE TO THE LIVER AND PANCREAS.

RTECS #:9999999ZZ

Ingred Name:SPILL PROC:LGR SPILLS:DIKE FAR AHEAD OF SPILL FOR LATER

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DISP. KEEP UNNEC PEOPLE AWAY. ISOLATE HAZ AREA & DENY ENTRY.
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:ACUTE:DUST/MIST WILL CAUSE SEVERE IRRIT, BURNS & DMG TO ALL TISSUE CNTCTD. CORR. INGEST:CORR. ACUTE:ABDOM PAIN, RETCHING & PRLNGD VOMIT MAY BEGIN 10-60 MIN AFTER EXCESSIVE INGEST OF SOLUBLE IRON SALTS . HEMATEMESIS, WATERY THEN TARRY DIARRHEA, INTENSE DEHYDRATION, SHOCK, PALLOR, CYANOSIS, HYPOTHERMIA, (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:RAPID, WEAK/IMPERCEPTIBLE PULSE, HYPOTENSION, RAPID RESP, ACIDOSIS, COAGULATION DEFECTS, DROWS, HYPOREFLEXIA, VASOMOTOR INSTABILITY, DILATED PUPILS, COMA MAY FOLLOW. DEATH FROM SHOCK MAY OCCU R W/IN 4-8 HRS. IF DEATH NOT IMMED,VICTIM MAY IMPROVE BUT CYANOSIS, PULM EDEMA, PNEUM FROM ASPIR OF VOMITUS (SUPP DATA)
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

First Aid:INHAL:REMOVE TO FRESH AIR. SUPPORT BRTHG (GIVE O2/ARTF RESP), CALL MD . EYE:FLUSH W/POTABLE WATER FOR AT LEAST 15 MIN, CALL MD . SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER, CALL MD . INGE ST:GET MD IMMEDIATELY . SEE ORIGINAL MSDS FOR FURTHER DETAILED FIRST AID PROCEDURES .

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

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR REGULAR FOAM.
Fire Fighting Procedures:MOVE CNTNR FROM FIRE AREA IF CAN DO W/OUT RISK. APPLY COOLING WATER TO SIDES OF CNTNRS EXPSD TO FLAMES UNTIL WELL AFTER FIRE OUT. STAY AWAY FROM ENDS(SUPP DATA)
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

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

Spill Release Procedures:DO NOT TOUCH SPILLED MATL. STOP LEAK IF CAN BE DONE W/OUT RISK. SML SPILLS:TAKE UP W/SAND/OTHER ABSORB MATL & PLACE IN CNTNRS FOR LATER DISP. SML,DRY:W/CLEAN SHOVEL PLACE MATL INTO CLEAN,DRY CNTNR & C OVER. MOVE CNTNRS FROM SPILL AREA. (ING7)
Neutralizing Agent:AGRICULTURAL LIME, SLAKED LIME, CRUSHED LIMESTONE OR SODIUM BICARBONATE.

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

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE SUBSTANCES.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

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

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Respiratory Protection:USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN . REFER TO ORIGINAL MSDS FOR ADDITIONAL INFO ON RESPIRATOR SELECTION .

Ventilation:PROVIDE LOCAL EXHAUST VENT &/OR GENERAL DILUTION VENT TO MEET PUBLISHED EXPOSURE LIMITS.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:CHEM WORK GOG/FULL LENGTH FSHLD .

Other Protective Equipment:IMPERVIOUS CLOTHING & EQUIPMENT. EYE WASH FOUNTAIN & QUICK DRENCH SHOWER W/IN IMMEDIATE WORK AREA.

Work Hygienic Practices:WASH THOROUGHLY AFTER USE & BEFORE EATING, DRINKING, SMOKING OR USING SANITARY FACILITIES .

Supplemental Safety and Health

APPEAR/ODOR:BROWNISH-YELLOW/ORANGE, VERY DELIQUESCENT, MONOCLINIC CRYSTALS W/SLIGHT ODOR OF HYDROGEN CHLORIDE. FIRE FIGHT PROC:OF TANKS. AVOID BRTHG CORR VAPS, KEEP UPWIND. WEAR NIOSH/MSHA APPROVED SC BA & FULL PROTECTIVE EQUIPMENT . EFTS OF OVEREXP: HYPERTHERMIA, ACIDOSIS, ANURIA, SHOCK, CONVULSIONS, COMA &(ING 3

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

HCC:C2

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

Solubility in Water:91.9%

Appearance and Odor:SUPP DATA

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

Stability Indicator/Materials to Avoid:YES

NA & K MAY CAUSE EXPLOSION ON IMPACT WITH SOLID. ALLYL CHLORIDE, ETHYLENE OXIDE & (ING 2)

Stability Condition to Avoid:MAY BURN, DOES NOT IGNITE READILY. FLAMM/POIS GAS MAY ACCUM IN TANKS/HOPPER CARS. MAY IGNITE COMBUST (WOOD, PAPER, OIL)

Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC AND CORROSIVE FUMES OF CHLORINE.

Conditions to Avoid Polymerization:FERRIC CHLORIDE, HEXAHYDRATE:MAY CATALYZE VIOLENT POLYMERIZATION OF ALLYL CHLORIDE, ETHYLENE OXIDE/AROMATIC MONOMERS.

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

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CNTCT DISTRICT DIRECTOR OF ENVIRONMENTAL PROTECTION AGENCY. REPORTABLE QUANTITY:100 LBS. EPA HAZ WAST E #D002.

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Material Safety Data Sheet

Ferric Nitrate Solution (1M)

ACC# 95190

Section 1 - Chemical Product and Company Identification

MSDS Name: Ferric Nitrate Solution (1M)

Catalog Numbers: S742001

Synonyms: Iron (III) nitrate nonahydrate; Nitric acid iron (3+) 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
7732-18-5	Water	60	231-791-2
7782-61-8	Ferric Nitrate Nonahydrate	40	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: not available liquid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause severe eye and skin irritation with possible burns. May cause severe respiratory and digestive tract irritation with possible burns. May cause methemoglobinemia. May cause liver and kidney damage.

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

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: May cause severe irritation and possible burns.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood),

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convulsions, and death. May cause systemic toxic effects on the heart, liver, and kidneys. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea.

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 effects similar to those described for ingestion. This product contains nitrite which may cause methemoglobinemia. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

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

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

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

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. 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: The use of Deferoxamine as a chelating agent should be determined only by qualified medical personnel. 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 spray to keep fire-exposed containers cool. Use water with caution and in flooding amounts. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Causes violent reactions when in contact with metals. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. 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 applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

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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: 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. 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 eyes, skin, and clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Keep from contact with clothing and other combustible materials.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool place in the original container and protect from sunlight. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

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

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Ferric Nitrate Nonahydrate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Ferric 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

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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: not available

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Not available.

Specific Gravity/Density:Not available.

Molecular Formula:Mixture

Molecular Weight:Not available

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated.

Conditions to Avoid: Incompatible materials, ignition sources, dust generation, combustible materials, reducing agents, temperatures above 50°C (122°F).

Incompatibilities with Other Materials: Reducing agents.

Hazardous Decomposition Products: Nitrogen oxides, irritating and toxic fumes and gases.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 7782-61-8: NO7175000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 7782-61-8:

Oral, rat: LD50 = 3250 mg/kg;

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Carcinogenicity:

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

CAS# 7782-61-8: 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:	NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	No information available.
Hazard Class:	5.1	
UN Number:	UN3218	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

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TSCA

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

CAS# 7782-61-8 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

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

Chemical Test Rules

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

Section 12b

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

TSCA Significant New Use Rule

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

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7782-61-8: immediate, fire, reactive.

Section 313

This material contains Ferric Nitrate Nonahydrate (listed as Water Dissociable Nitrate Compounds), 40%, (CAS# 7782-61-8) 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# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7782-61-8 can be found on the following state right to know lists: California, (listed as Iron salts (soluble)), Pennsylvania, (listed as Iron salts (soluble)), Minnesota, (listed as Iron salts (soluble)).

California Prop 65

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

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

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

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 24/25 Avoid contact with skin and eyes.

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WGK (Water Danger/Protection)

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

CAS# 7782-61-8: 1

Canada - DSL/NDSL

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

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

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

Canadian Ingredient Disclosure List

CAS# 7782-61-8 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- FERRIC-FERROUS OXIDE, I119500 -- 6810-00N027277

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

Product ID:FERRIC-FERROUS OXIDE, I119500

MSDS Date:04/16/1991

FSC:6810

NIIN:00N027277

MSDS Number: BNLSD

=== 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:IRON OXIDE

CAS:1317-61-9

Fraction by Wt: 100%

OSHA PEL:10 MG/M3

ACGIH TLV:5 MG/M3

Ingred Name:SUPP DATA:SKIN:NO DATA AVAIL. EYE:DUSTS MAY CAUSE IRRIT.
PARTICLES OF IRON/IRON CMPDS WHICH BECOME IMBEDDED IN (ING 3)

RTECS #:9999999ZZ

Ingred Name:ING 2:EYE MAY CAUSE SIDEROSIS W/VARIED EFTS. DISCOLORING OF
IRIS TO YELLOWISH GREEN OR BROWN IS EARLIEST & MOST (ING 4)

RTECS #:9999999ZZ

Ingred Name:ING 3:COMMON SIGN OF SIDEROSIS. CHRONIC:METAL FUME FEVER:NO

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FORM OF CHRONIC METAL FUME FEVER, BUT RPTD BOUTS W/ (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4:SYMPS AS DESCRIBED QUITE COMMON. RESISTANCE TO CNDTN
DEVELOPS AFTER FEW DAYS OF EXPOS, BUT QUICKLY LOST IN (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:1 OR 2 DAYS. SKIN:REPEATED OR PROLONGED EXPOSURE MAY
CAUSE IRRITATION.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC:15 MINS. GET MD IMMED. INGEST:TREAT
SYMPTOMATICALLY & SUPPORTIVELY. GET MD IMMED. IF VOMIT OCCURS, (ING
8)
RTECS #:9999999ZZ

Ingred Name:ING 7:KEEP HEAD LOWER THAN HIPS TO PROVENT ASPIRATION.
RTECS #:9999999ZZ

Ingred Name:MATLS TO AVOID:VIOLENTLY EXPLOSIVE IGNITION. HYDROGEN
TRISULFIDE:DECOMPOSITION WITH IGNITION.
RTECS #:9999999ZZ

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

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:FERRIC-FERROUS OXIDE:INHAL:RPTD/PRLNGD
EXPOS, USUALLY 6-10 YEARS, MAY CAUSE SIDEROSIS, A BENIGN
PNEUMOCONIOSIS. CHRONIC BRONCH & DYSPNEA ON EXERTION HAVE BEEN
ASSOC W/PNEUMOCONIOSIS. METAL FUME FEVER: ACUTE:METAL FUME FEVER,
AN INFLUENZA-LIKE ILLNESS, MAY OCCUR DUE TO INHAL OF FRESHLY FORMED
METAL OXIDE(EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:HLTH HAZ:PARTICLES SIZED BELOW 1.5 MICRONS &
USUALLY BETWEEN 0.02-0.05 MICRONS. SYMPS MAY BE DELAYED 4-12 HOURS
& BEGIN W/SUDDEN ONSET OF THIRST, & SWEET, METALLIC OR FOUL TASTE
IN MOUTH. OTHER SYMPS MAY INCL UPPER RESP TRACT IRRIT ACCOMPANIED
BY COUGHING & DRYNESS OF MUC MEMB, LASSITUDE & GENERALIZED FEELING
(SUPDAT)
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

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

First Aid:INHAL:MOVE TO FRESH AIR IMMED. IF BRTHG STOPPED, GIVE ARTF
RESP. KEEP WARM & AT REST. TREAT SYMP & SUPPORTIVELY. GET MD IMMED.
SKIN:REMOVE CONTAM CLTHG & SHOES IMMED. WASH AREA W/SOAP OR MILD
DETERGEN T & LGE AMTS OF WATER UNTIL NO EVIDENCEOF CHEM REMAINS
(APPROX 15-20 MINS). GET MD IMMED. EYE:WASH IMMED W/LGE AMTS OF
WATER/NORMAL SALINE, OCCASIONALLY LIFTING UPPER/LOWER LIDS FOR AT
LEAST (ING 7)

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

Extinguishing Media:EXTINGUISH USING AGENT SUITABLE FOR TYPE OF
SURROUNDING FIRE.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL

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PROTECTIVE EQUIPMENT . NO ACUTE HAZARD. MOVE CNTNR FROM FIRE AREA IF POSSIBLE. AVOID BRTHG VAPS/DUSTS;KEEP UPWIND.
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 MINIMUM OF DUSTING & PLACE INTO SUITABLE CLEAN, DRY CONTAINERS FOR RECLAMATION OR LATER DISPOSAL. RESIDUE SHOULD BE CLEANED UP USING A HIGH-EFFICIENCY PARTICULATE FILTER VACUUM.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

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

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE SUBSTANCES.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

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

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN . FOR MORE SPECIFIC INFORMATION CONCERNING SPECIFIC TYPES REFER TO ORIGINAL MSDS .
Ventilation:PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:IMPERVIOUS CLOTHING & EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
EFTS OF OVEREXP:OF MALAISE. FEVER, CHILLS, MUSCULAR PAIN, MILD TO SEVERE HDCH, NAUS, OCCASIONAL VOMIT, EXAGGERATED MENTAL ACTIVITY, PROFUSE SWEATING, EXCESSIVE URINATION, DIARR & PROSTRATION MAY ALSO OCCUR. TOLERANCE TO FUMES DEVELOPS RAPIDLY, BUT QUICKLY LOST. ALL SYMPS USUALLY SUBSIDE W/IN 24-36 HOURS. (ING 2)

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

HCC:N1
Melt/Freeze Pt:M.P/F.P Text:>2892F,>158
Spec Gravity:5.18
Solubility in Water:INSOLUBLE
Appearance and Odor:ODORLESS, BLACK CUBES OR AMORPHOUS POWDER

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

Stability Indicator/Materials to Avoid:YES
FERRIC-FERROUS OXIDE:ALUMINUM + CALCIUM SILICIDE + SODIUM NITRATE:VIOLENTLY EXPLOSIVE. ALUMINUM + SULFUR: (ING 9)
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE TOXIC AND/OR HAZARDOUS GASES.

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

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS

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WHEN STORING OR DISPOSING OF SUBSTANCE. CONTACT THE DISTRICT
DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Ferric Sulfate Monohydrate

ACC# 45419

Section 1 - Chemical Product and Company Identification

MSDS Name: Ferric Sulfate Monohydrate

Catalog Numbers: S80013, S93243

Synonyms: Diiron Trisulfate; Ferric Sulfate; Iron Persulfate; Iron Sesquisulfate; Iron Sulfate (2:3); Iron (3+) Sulfate; Sulfuric Acid, Iron

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10028-22-5	Ferric sulfate, monohydrate	100	233-072-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow-gray solid.

Caution! May cause respiratory tract irritation. Causes severe digestive tract irritation with pain, nausea, vomiting and diarrhea. May corrode the digestive tract with hemorrhaging and possible shock. May cause liver and kidney damage.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause liver and kidney damage.

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Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

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

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

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

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

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

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

Extinguishing Media: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Discard contaminated shoes.

Storage: Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ferric sulfate, monohydrate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Ferric sulfate, monohydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: yellow-gray

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: Decomposes.

Decomposition Temperature: 480 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 3.097

Molecular Formula: Fe₂(SO₄)₃.H₂O

Molecular Weight: 399.8668

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Material Safety Data Sheets, Carver Hall RM 208-A

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Corrosive to metals.

Hazardous Decomposition Products: Sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 10028-22-5: NO8505000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10028-22-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, INORGANIC,	No information available.

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	N.O.S.	
Hazard Class:	8	
UN Number:	UN3260	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10028-22-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10028-22-5: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10028-22-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10028-22-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

Material Safety Data Sheets, Carver Hall RM 208-A

R 22 Harmful if swallowed.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 10028-22-5: 1

Canada - DSL/NDSL

CAS# 10028-22-5 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10028-22-5 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

Material Safety Data Sheet

Ferrocene

ACC# 03388

Section 1 - Chemical Product and Company Identification

MSDS Name: Ferrocene

Catalog Numbers: AC119140000, AC119140050, AC119141000, AC119145000

Synonyms: Biscyclopentadienyliron; di-2,4-cyclopentadien-1-yliron; ferrotsen; Bis(cyclopentadiene); Iron Dicyclopentadienyl.

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
102-54-5	Ferrocene	98	203-039-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange-brown crystalline powder.

Warning! Flammable solid. May cause eye, skin, and respiratory tract irritation. May be harmful if swallowed. May cause blood abnormalities. May cause liver damage. Heat sensitive. The toxicological properties of this material have not been fully investigated.

Target Organs: Blood, liver.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. May cause damage to the red blood cells. May cause nausea, vomiting, abdominal pain, and increased salivation.

Inhalation: Inhalation of dust may cause respiratory tract irritation. Can produce delayed pulmonary edema.

Chronic: Prolonged or repeated inhalation may cause kidney and lung damage.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Dust can be an explosion hazard when exposed to heat or flame. Flammable solid. May burn rapidly with flare burning effect. May re-ignite after fire is extinguished.

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: 2; Flammability: 2; 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. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid

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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.

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
Ferrocene	10 mg/m ³ TWA	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Ferrocene: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: orange-brown

Odor: camphor

pH: Not available.

Vapor Pressure: 0.05 mbar @ 40

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 249 deg C @ 760 mm Hg

Freezing/Melting Point: 173 - 176 deg C

Decomposition Temperature: > 465 deg C

Solubility: Insoluble.

Specific Gravity/Density: Not available.

Molecular Formula: C₁₀H₁₀Fe

Molecular Weight: 186.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Heat sensitive
Conditions to Avoid: Incompatible materials, ignition sources, 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# 102-54-5: LK0700000

LD50/LC50:

CAS# 102-54-5:

Oral, mouse: LD50 = 832 mg/kg;

Oral, rat: LD50 = 1320 mg/kg;

Carcinogenicity:

CAS# 102-54-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	FLAMMABLE SOLIDS, ORGANIC, N.O.S.	FLAMMABLE SOLIDS, ORGANIC, N.O.S.
Hazard Class:	4.1	4.1
UN Number:	UN1325	UN1325
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 102-54-5 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# 102-54-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

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European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN F N

Risk Phrases:

R 11 Highly flammable.

R 22 Harmful if swallowed.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 102-54-5: No information available.

Canada - DSL/NDSL

CAS# 102-54-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, B4.

This product has been classified in accordance with 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# 102-54-5 is listed on the Canadian Ingredient Disclosure List.

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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

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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

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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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SPECTRUM CHEMICAL MFG CORP. -- FERROUS SULFATE HEPTAHYDRATE, F3240 -- 6810-003005157

=====
Product Identification
=====

Product ID:FERROUS SULFATE HEPTAHYDRATE, F3240
MSDS Date:09/26/1997
FSC:6810
NIIN:003005157
Status Code:A
MSDS Number: CJNNL
=== Responsible Party ===
Company Name:SPECTRUM CHEMICAL MFG CORP.
Address:14422 SOUTH SAN PEDRO STREET
City:GARDENA
State:CA
ZIP:90248
Country:US
Info Phone Num:310-516-8000
Emergency Phone Num:800-424-9300
Preparer's Name:E BRULL
Chemtrec Ind/Phone:(800)424-9300
CAGE:63415

=====
Contractor Identification
=====

Company Name:SPECTRUM LABORATORY PRODUCTS INC
Address:14422 S SAN PEDRO ST
Box:City:GARDENA
State:CA
ZIP:90248-2027
Country:US
Phone:310-516-8000/FAX: 310-516-9843
CAGE:63415

=====
Composition/Information on Ingredients
=====

Ingred Name:FERROUS SULFATE HEPTAHYDRATE
CAS:7782-63-0
RTECS #:NO8510000
= Wt:100.
EPA Rpt Qty:1000 LBS
DOT Rpt Qty:1000 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50: (ORAL,RAT) 1480 MG/KG
Routes of Entry: Inhalation:NO Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE: VERY DANGEROUS IN CASE OF SKIN CONTACT (IRRITANT), OF EYE CONTACT (IRRITANT). VERY SLIGHTLY TO SLIGHTLY DANGEROUS IN CASE OF INGESTION, OF INHALATION. THIS PRODUCT MAY IRRITATE EYES & SKIN UPON CONTACT. INFLAMMATION OF EYE IS CHARACTERIZED BY REDNESS, WATERING, AND ITCHING. SKIN INFLAMMATION IS CHARACTERIZED BY ITCHING, SCALING, REDDENING, OR, OCCASIONALLY, BLISTERING. CHRONIC: VERY DANGEROUS IN CASE OF SKIN CONTACT (IRRITANT), OF EYE CONTACT (IRRITANT). VERY SLIGHTLY TO SLIGHTLY DANGEROUS IN CASE OF INGESTION, OF INHALATION.
CARCINOGENIC EFTS: NOT AVAILABLE. MUTAGENIC EFTS: NOT AVAIL. (EFTS OF OVEREXP)
Effects of Overexposure:HLTH HAZS: TERATOGENIC EFTS: NOT AVAILABLE. THE

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SUBSTANCE IS TOXIC TO LUNGS, LIVER, TOX OF PROD TO THE REPRODUCTIVE SYSTEM: NOT AVAILABLE. RPTD OR PRLNGD EXPOSURE TO SUBSTANCE CAN PRODUCE TARGET ORGAN S DAMAGE. RPTD/PRLNGD INHAL OF DUST MAYLEAD TO CHRONIC RESP IRRIT.

===== First Aid Measures =====

First Aid: EYE CONT: CHECK FOR & REMOVE ANY CONTACT LENSES. IMMEDIATELY FLUSH W/RUNNING WATER FOR @ LST 15 MINS, KEEPING EYELIDS OPEN. COLD WATER MAY BE USED. DO NOT USE EYE OINTMENT. SEEK MED ATTN. SKIN CONT: IF CHEM GOT ONTO CLOTHED PORTION OF BODY, REMOVE CONTAMD CLOTHES AS QUICKLY AS POSS, PROTECTING YOUR OWN HANDS & BODY. PLACE VICTIM UNDER DELUGE SHOWER. IF CHEM TOUCHES VICTIM'S EXPOSED SKIN, SUCH AS HANDS, NEUT EXPOSED SKIN W/DILUTE SOLN OF SODIUM CARBONATE. GENTLY & THOROUGHLY WASH CONTAMD SKIN W/RUNNING WATER & NON-ABRASIVE SOAP. (SUPDAT)

===== Fire Fighting Measures =====

Extinguishing Media: NON-FLAMMABLE. MEDIA SUITABLE FOR SURROUNDING FIRE

Fire Fighting Procedures: USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT.

Unusual Fire/Explosion Hazard: RISKS OF EXPLOSION OF PROD IN PRESENCE OF MECH IMPACT: NOT AVAIL. RISKS OF EXPLOSION OF PROD IN PRESENCE OF STATIC DISCHARGE: NOT AVAIL. NO SPECIFIC INFO IS AVAILABLE IN DATABASE REGARDING PROD'S RISKS OF EXPLOSION IN PRESENCE OF VARIOUS MATERIALS.

===== Accidental Release Measures =====

Spill Release Procedures: SM SPILL: USE APPROP TOOLS TO PUT SPILLED SOLID IN CONVENIENT WASTE DISP CNTNR. IF NEC: NEUT RESIDUE W/DILUTE SOLN OF SODIUM CARBONATE. FINISH CLEANING BY SPREADING WATER ON CONTAMD SURF & DISPOSE OF ACCORD TO LOC & REGIONAL AUTHORITY REQUIREMENTS. LG SPILL: USE SHOVEL TO PUT MATL INTO CONVENIENT WASTE DISP CNTNR. NEUT RESIDUE W/DILUTE SOLN OF SODIUM CARBONATE. Neutralizing Agent: NEUTRALIZE THE RESIDUE WITH A DILUTE SOLUTION OF SODIUM CARBONATE.

===== Handling and Storage =====

Handling and Storage Precautions: DO NOT INGEST. DO NOT BREATHE DUST. IF INGESTED, SEEK MEDICAL ADVICE IMMEDIATELY AND SHOW THE CONTAINER OR THE LABEL. AVOID CONTACT WITH SKIN AND EYES. KEEP AWAY FROM INCOMPATIBLES AS OXIDIZING AGENTS, REDUCING AGENTS, ACIDS, MOISTURE.

Other Precautions: NO SPECIFIC STORAGE IS REQD. USE SHELVES OR CABINETS STURDY ENOUGH TO BEAR THE WEIGHT OF THE CHEMICALS. BE SURE THAT IT IS NOT NECESSARY TO STRAIN TO REACH MATERIALS, AND THAT SHELVES ARE NOT OVERLOADED.

===== Exposure Controls/Personal Protection =====

Respiratory Protection: USE PROCESS ENCLOSURES, LOCAL EXHST VENT/OTHER ENGINEERING CTLS TO KEEP AIRBORNE LEVELS BELOW REC EXPOSURE LIMITS. IF USER OPERATIONS GENERATE DUST, FUME/MIST, USE VENT TO KEEP EXPOS TO AIRBORNE CONTAMINANTS BELOW EXPOS LIMIT. NIOSH APPROVED

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RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .
Ventilation:LOCAL EXHAUST.
Protective Gloves:IMPERVIOUS GLOVES.
Eye Protection:ANSI APPROVED CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:ANSI APPROVED EYE WASH & DELUGE SHOWER . LAB
COAT. LG SPILL: SUGGESTED PROTECTIVE CLOTHING MIGHT NOT BE
SUFFICIENT; CONSULT SPECIALIST BEFORE HNDLG PRODUCT.
Supplemental Safety and Health
FIRST AID PROC: BE PARTICULARLY CAREFUL TO CLEAN FOLDS, CREVICES,
CREASES & GROIN. COLD WATER MAY BE USED. COVER IRRITATED SKIN
W/EMOLLIENT. IF IRRIT PERSISTS, SEEK MED ATTN. WASH CONTAMD CLTHG
BEFORE REUSING. SERIOUS SKIN CONT: WASH W/DISINFECTANT SOAP &
COVER CONTAMD SKIN WITH (OTHER INFO)

===== Physical/Chemical Properties =====

Melt/Freeze Pt:=56.6C, 133.8F
M.P/F.P Text:DECOMPOSES
Vapor Pres:14.6 @ 20C
pH:4(1%SOLN/WATER)
Solubility in Water:SOL IN COLD WATER.
Appearance and Odor:SOLID BLUE TO BLUE-GREEN. (LIGHT)

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
SLIGHTLY REACTIVE TO REACTIVE WITH OXIDIZING AGENTS, REDUCING AGENTS,
ACIDS, MOISTURE.

===== Toxicological Information =====

Toxicological Information:CHRONIC EFTS ON HUMANS:THE SUBSTANCE IS TOXIC
TO LUNGS, LIVER. TOX OF PROD TO REPROD SYS: NOT AVAIL. OTHER TOXIC
EFTS ON HUMANS: VERY DANGEROUS IN CASE OF SKIN CONT(IRRIANT), OF
EYE CONT(IRRIANT). V ERY SLIGHTLY TO SLIGHTLY DANGEROUS IN CASE OF
INGESTION, OF INHALTION. SPEC REMARKS ON TOX TO ANIMALS: NO ADDNL
REMARK. SPEC REMARKS ON HUMANS: EXCRETED IN MATERNAL MILK IN
ANIMAL. SPEC REMARKS ON OTH ER TOXIC EFTS IN HUMANS: NO ADDNL
REMARK.

===== Ecological Information =====

Ecological:EXOTOXICITY: NOT AVAILABLE. BOD5 AND COD: NOT AVAILABLE.
PRODS OF BIODEGRADATION: SOME METALLIC OXIDES. TOC OF PRODS OF
BIODEGRADATION: PROD ARE MORE TOXIC.

===== Disposal Considerations =====

Waste Disposal Methods:RECYCLE TO PROCESS, IF POSSIBLE. CONSULT YOUR
FEDERAL, STATE, LOCAL AND REGIONAL AUTHORITIES.

===== MSDS Transport Information =====

Transport Information:DOT CLASSIFICATION: NOT DOT CONTROLLED MATERIAL
(UNITED STATES). IDENTIFICATION: NA9125 III.

===== Regulatory Information =====

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SARA Title III Information:FOLLOWING PROD(S) ARE LISTED ON SARA 313:
FERROUS SULFATE HEPTAHYDRATE.

Federal Regulatory Information:FOLLOWING PROD(S) IS (ARE) LISTED BY
CERCLA: FERROUS SULFATE HEPTAHYDRATE. OSHA HAZARDOUS BY DEFINITION
OF HAZARD COMMUNICATION STD (29 CFR 1910.1200). WHMIS (CANADA):
WHMIS CLASS D-2A: MATL CAUSING O THER TOXIC EFTS (VERY TOXIC). DSSL
(EEC): R22-HARMFUL IF INGESTED. R42-MAY CAUSE SENSITIZATION BY
INHALATION. R38/38-IRRITATING TO EYES & SKIN.

State Regulatory Information:FOLLOWING PROD(S) IS (ARE) LISTED BY STATE
OF MASSACHUSETTS & PENNSYLVANIA: FERROUS SULFATE HEPTAHYDRATE.
WARNING PROD CNTNS CHEM KNOWN TO STATE OF CALIFORNIA TO CAUSE
CANCER. CHEM INGRED(S) REQUIRIN G THIS WARNING: NONE. WARNING:
PROD CNTNS CHEM KNOWN TO STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS
OR OTHER REPRODUCTIVE HARM. CHEM INGRED(S) REQUIRING THIS WARNING:
NONE.

===== Other Information =====

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particular situation.

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CHEM SERVICE INC -- FERROUS SULFATE-HEPTAHYDRATE, I-57 -- 6810-00N067466

=====
Product Identification
=====

Product ID:FERROUS SULFATE-HEPTAHYDRATE, I-57

MSDS Date:09/01/1988

FSC:6810

NIIN:00N067466

MSDS Number: CBFXD

=== Responsible Party ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Info Phone Num:215-692-3026

Emergency Phone Num:215-692-3026

CAGE:84898

=== Contractor Identification ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Phone:215-692-3026

CAGE:84898

Company Name:CHEM SERVICE, INC

Address:660 TOWER LN

Box:599

City:WEST CHESTER

State:PA

ZIP:19301-9650

Country:US

Phone:610-692-3026

CAGE:8Y898

=====
Composition/Information on Ingredients
=====

Ingred Name:IRON (II) SULFATE (1:1), HEPTAHYDRATE; (FERROUS SULFATE)
(CERCLA)

CAS:7782-63-0

RTECS #:NO8510000

OSHA PEL:N/K

ACGIH TLV:1 MG/M3 (MFR)

EPA Rpt Qty:1000 LBS

DOT Rpt Qty:1000 LBS

Ingred Name:SUPDAT:MEASURES UNTIL MED ASSISTANCE HAS ARRIVED. INGEST:DO
NOT ADMIN LIQS/INDUCE VOMIT TO UNCON/CONVULSING PERS.(ING 3)

RTECS #:9999999ZZ

Ingred Name:ING 2:IF SWALLOWED DRINK 1-2 GLASSES OF WATER. CONT POIS
CTL CTR IMMED IF NEC. GET MED ATTN IF NEC. IF PATIENT IS(ING 4)

RTECS #:9999999ZZ

Ingred Name:ING 3:VOMIT-WATCH CLOSELY TO MAKE SURE AIRWAY DOES NOT
BECOME OBSTRUCTED BY VOMIT. NOTE:AN ANTIDOTE IS A (ING 5)

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RTECS #:9999999ZZ

Ingred Name:ING 4:SUBSTANCE INTENDED TO COUNTERACT EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:CAN BE OBTAINED FROM A POISON CONTROL CENTER.
RTECS #:9999999ZZ

Ingred Name:EYE PROT:& FULL LENGTH FACESHIELD .
RTECS #:9999999ZZ

==== Hazards Identification =====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 1398 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:ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT! VAPORS &/OR DIRECT CONTACT CAN CAUSE SEVERE EYE BURNS. CAN CAUSE SKIN IRRITATION. REPEATED EXPOSURE TO VAPORS &/OR DUST CA N CAUSE EYE INJURY. CAN BE HARMFUL IF INHALED. DUST &/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:TRACT. CAN BE HARMFUL IF SWALLOWED. CAN CAUSE GASTRO-INTESTINAL DISTURBANCES. CAN CAUSE BLOOD DISORDERS. CAN BE IRRITATING TO MUCOUS MEMBRANES. INGESTION MAY CAUSE DIARRHEA. THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

==== First Aid Measures =====

First Aid:EYES:FLUSH CONTINUOUSLY W/WATER FOR AT LST 15-20 MINS.
SKIN:FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURRED-USE SOAP & WATER TO CLEANSE. REMOVE & WASH CONTAM CLTHG. DO NOT WEAR SHOES/CLTHG UNT IL ABSOLUTELY FREE OF ALL CHEM ODORS. INHAL:REMOVE PATIENT TO FRESH AIR. ADMIN OXYG IF PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS EXHIBITING (SUPDAT)

==== Fire Fighting Measures =====

Flash Point:NON FLAMMABLE
Extinguishing Media:MEDIA SUITABLE FOR SURROUNDING FIRE .
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NO FIRE OR EXPLOSION HAZARD. NO EXPLOSION LIMITS ARE AVAILABLE FOR THIS COMPOUND.

==== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR APPROPRIATE OSHA-REGULATED EQUIPMENT. VENTILATE AREA. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

==== Handling and Storage =====

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Handling and Storage Precautions:AVOID CONTACT W/SKIN, EYES & CLOTHING.
KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE. STORE ONLY
W/COMPATIBLE CHEMICALS.

Other Precautions:PERSONS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD
NOT HANDLE THIS CHEM/ITS CNTNR. THIS PROD IS FURNISHED FOR LAB USE
ONLY! PRODS MAY NOT BE USED AS DRUGS, COSMETICS,
AGRICULTURAL/PESTICIDAL PRODS, FO OD ADDITIVES/AS HOUSEHOLD
CHEMICALS.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN .

Ventilation:THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS (ING 7)

Other Protective Equipment:EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET
ANSI DESIGN CRITERIA . USE APPROP NIOSH/MSHA APPRVD SAFETY EQUIP.

Work Hygienic Practices:CONTACT LENSES SHOULD NOT BE WORN IN THE
LABORATORY.

Supplemental Safety and Health

CNDTNS (STAB):SENSITIVE. EFFLORESCENT. MATLS TO AVOID:AS CNTNRS.

CORRODES STEEL, COPPER & ITS ALLOYS. INCOMPAT W/IRON, ZINC & OTHER
LIGHT METALS. DECOMPOSED BY CHLORINE GAS. FIRST AID PROC:SIGNS OF
SHO CK - KEEP WARM & QUIET. GET MED ATTN IFNEC. IF PATIENT IS IN
CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING (ING 2)

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:147F,64C

Spec Gravity:1.898

Solubility in Water:SOLUBLE

Appearance and Odor:BLUE-GREEN CRYSTALLINE SOLID.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

REACTS W/ACIDS HALIDES & ANHYDRIDES, THIONYL CHLORIDE, CARBONATES. DO
NOT USE MAGNESIUM/ALUMINUM OR THEIR ALLOYS (SUPDAT)

Stability Condition to Avoid:EASILY OXIDIZED-MAY BE PEROXIDE

FORMER-CHECK FOR PEROXIDES ON ALL OPENED SAMPLES. DECOMP PRODS ARE
CORR. AIR (SUPP DATA)

Hazardous Decomposition Products:DECOMPOSITION LIBERATES TOXIC FUMES.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL
REGULATIONS . FLUSH TO SEWER W/COPIOUS AMOUNTS OF WATER.

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.

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CHEM SERVICE INC -- FERROUS SULFIDE, I-58 -- 6810-00N067467

=====
Product Identification
=====

Product ID:FERROUS SULFIDE, I-58

MSDS Date:09/01/1988

FSC:6810

NIIN:00N067467

MSDS Number: CBFXF

=== Responsible Party ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Info Phone Num:215-692-3026

Emergency Phone Num:215-692-3026

CAGE:84898

=== Contractor Identification ===

Company Name:CHEM SERVICE INC

Box:3108

City:WEST CHESTER

State:PA

ZIP:19381

Country:US

Phone:215-692-3026

CAGE:84898

Company Name:CHEM SERVICE, INC

Address:660 TOWER LN

Box:599

City:WEST CHESTER

State:PA

ZIP:19301-9650

Country:US

Phone:610-692-3026

CAGE:8Y898

=====
Composition/Information on Ingredients
=====

Ingred Name:FERROUS SULFIDE

CAS:1317-37-9

OSHA PEL:N/K

ACGIH TLV:1 MG/M3 (MFR)

Ingred Name:SUPDAT:ATTN IF NEC. IF PATIENT IS IN CARDIAC ARREST ADMIN
CPR CONTINUE LIFE SUPPORTING MEASURES UNTIL MED (ING 3)

RTECS #:9999999ZZ

Ingred Name:ING 2:ASSISTANCE HAS ARRIVED. INGEST:DO NOT ADMIN
LIQS/INDUCE VOMIT TO UNCON/CONVULSING PERS. IF SWALLOWED DRINK (ING
4)

RTECS #:9999999ZZ

Ingred Name:ING 3:1-2 GLASSES OF WATER. CONT POIS CTL CTR IMMED IF NEC.
GET MED ATTN IF NEC. IF PATIENT IS VOMIT-WATCH (ING 5)

RTECS #:9999999ZZ

Ingred Name:ING 4:CLOSELY TO MAKE SURE AIRWAY DOES NOT BECOME

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OBSTRUCTED BY VOMIT. NOTE:AN ANTIDOTE IS A SUBSTANCE INTENDED (ING 6)

RTECS #:9999999ZZ

Ingred Name:ING 5:TO COUNTERACT EFT OF A POIS. IT SHOULD BE ADMINISTERED BY MD/TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED (ING 7)

RTECS #:9999999ZZ

Ingred Name:ING 6:FROM A POISON CONTROL CENTER.

RTECS #:9999999ZZ

Ingred Name:EYE PROT:& FULL LENGTH FACESHIELD .

RTECS #:9999999ZZ

===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ALL CHEMICALS SHOULD BE CONSIDERED

HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT! VAPORS &/OR DIRECT CONTACT CAN CAUSE SEVERE EYE BURNS. CAN CAUSE SKIN IRRITATION. CAN BE HARMFUL IF ABSORBED THROUGH SKIN. REPEATED EXPOSURE TO VAPORS &/OR DUST CAN CAUSE EYE INJURY. CAN BE HARMFUL IF INHALED. DUST &/OR (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HLTH HAZ:VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED! CAN CAUSE NERVOUS SYSTEM INJURY. CAN CAUSE GASTRO-INTESTINAL DISTURBANCES. CAN BE IRRITATING TO MUCOUS MEMBRANES. NO TOXICITY DATA HAS BEEN FOUND. ASSUMETHIS CHEMICAL IS TOXIC & USE SPECIAL CARE TO AVOID CONTACT.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:EYES:FLUSH CONTINUOUSLY W/WATER FOR AT LST 15-20 MINS.

SKIN:FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURRED-USE SOAP & WATER TO CLEANSE. REMOVE & WASH CONTAM CLTHG. DO NOT WEAR SHOES/CLTHG UNT IL ABSOLUTELY FREE OF ALL CHEM ODORS. INHAL:REMOVE PATIENT TO FRESH AIR. ADMIN OXYG IF PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS EXHIBITING (SUPDAT)

===== Fire Fighting Measures =====

Extinguishing Media:CARBON DIOXIDE OR DRY CHEMICAL POWDER. DO NOT USE WATER.

Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:NO EXPLOSION LIMITS ARE AVAILABLE FOR THIS COMPOUND.

===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. WEAR APPROPRIATE OSHA-REGULATED EQUIPMENT. VENTILATE AREA. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE

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ANY RESIDUES.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:AVOID CONTACT W/SKIN, EYES & CLOTHING.
KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE. STORE ONLY
W/COMPATIBLE CHEMICALS.

Other Precautions:PERSONS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD
NOT HANDLE THIS CHEM/ITS CNTNR. THIS PROD IS FURNISHED FOR LAB USE
ONLY! PRODS MAY NOT BE USED AS DRUGS, COSMETICS,
AGRICULTURAL/PESTICIDAL PRODS, FOOD ADDITIVES/AS HOUSEHOLD
CHEMICALS.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN .

Ventilation:THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS (ING 8)

Other Protective Equipment:EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET
ANSI DESIGN CRITERIA . USE APPROP NIOSH/MSHA APPROVD SAFETY EQUIP.

Work Hygienic Practices:CONTACT LENSES SHOULD NOT BE WORN IN THE
LABORATORY.

Supplemental Safety and Health

CNDTNS (STAB):EXPOS TO AIR. COMBUST. THIS MATL IS CAPABLE OF CREATING
DUST EXPLO. DECOMPOSES UNDER ACIDIC CNDTNS. DECOMPOSED BY MOISTURE.
DECOMP PRODS ARE FLAMM. AIR SENSITIVE. MATLS TO AVOID:ALUMINUM OR
THEIR ALLOYS AS CNTNRS. DECOMPOSED BY CHLORINE GAS. FIRST AID
PROC:SIGNS OF SHOCK - KEEP WARM & QUIET. GET MED(ING 2)

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:2181F,1194C

Spec Gravity:4.74

Solubility in Water:INSOL (IMMISCIBLE)

Appearance and Odor:BLACK CRYSTALLINE SOLID.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

CONT W/ACIDS LIBERATES POIS GASES. INCOMPAT W/STRONG ACIDS, STRONG
OXIDIZING AGENTS. DO NOT USE MAGNESIUM/ (SUPP DATA)

Stability Condition to Avoid:EASILY OXIDIZED-MAY BE PEROXIDE

FORMER-CHECK FOR PEROXIDES ON ALL OPENED SAMPLES. FLAMM. DANGER!
IGNITES WHEN (SUPDAT)

Hazardous Decomposition Products:DECOMPOSITION LIBERATES TOXIC FUMES.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL
REGULATIONS . BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER
& SCRUBBER.

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Material Safety Data Sheet

Florisil

ACC# 91725

Section 1 - Chemical Product and Company Identification

MSDS Name: Florisil

Catalog Numbers: 1113113, 1113114, 1113115, 1113116

Synonyms: None Known.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1343-88-0	Magnesium Silicate Hydrate	ca. 100	215-681-1

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Use agent most appropriate to extinguish fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and

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clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium Silicate Hydrate	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium Silicate Hydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Not available.

Specific Gravity/Density:2.510

Molecular Formula:Not applicable.

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide, oxides of manganese, oxides of silicon.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 1343-88-0 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1343-88-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1343-88-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1343-88-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

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European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1343-88-0: 0

Canada - DSL/NDSL

CAS# 1343-88-0 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Fluorescein

ACC# 90367

Section 1 - Chemical Product and Company Identification

MSDS Name: Fluorescein

Catalog Numbers: NC9481589

Synonyms: 9-(o-Carboxyphenyl)-6-hydroxy-3-isoxanthenone; Dihydroxyfluorane; 3,6-Fluorandiol.

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
2321-07-5	Fluorescein	100 %	219-031-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-orange solid.

Warning! Causes eye irritation. May cause sensitization by skin contact.

Target Organs: Eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. May cause chemical conjunctivitis.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause sensitization by skin contact.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: 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. Reduce airborne dust and prevent scattering by moistening with water. Clean up spills immediately, observing precautions in the Protective Equipment section.

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. 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: 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
Fluorescein	none listed	none listed	none listed

OSHA Vacated PELs: Fluorescein: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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-orange

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:290 deg C

Decomposition Temperature:Not available.

Solubility: Insoluble in water.

Specific Gravity/Density:Not available.

Molecular Formula:C₂₀H₁₂O₅

Molecular Weight:332.081

Section 10 - Stability and Reactivity

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Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 2321-07-5: LM5075000

LD50/LC50:

CAS# 2321-07-5:

Draize test, rabbit, eye: 100 uL/24H Severe;

Carcinogenicity:

CAS# 2321-07-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutation in bacteria.

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

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	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# 2321-07-5 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# 2321-07-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

Material Safety Data Sheets, Carver Hall RM 208-A

R 36 Irritating to eyes.

R 43 May cause sensitization by skin contact.

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# 2321-07-5: 1

Canada - DSL/NDSL

CAS# 2321-07-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheets, Carver Hall RM 208-A

KNAUF FIBER GLASS GMBH -- BLOWING WOOL -- 5640-00N024527

=====
Product Identification
=====

Product ID: BLOWING WOOL
MSDS Date: 12/10/1987
FSC: 5640
NIIN: 00N024527
MSDS Number: BMFZX
==== Responsible Party ====
Company Name: KNAUF FIBER GLASS GMBH
Address: 240 ELIZABETH ST
City: SHELBYVILLE
State: IN
ZIP: 46176
Country: US
Info Phone Num: 317-398-4434
Emergency Phone Num: 317-398-4434
Preparer's Name: ROBERT BRUNSMAN
CAGE: 64591

==== Contractor Identification ====

Company Name: KNAUF FIBER GLASS
Address: 240 ELIZABETH ST
Box: City: SHELBYVILLE
State: IN
ZIP: 46176
Country: US
Phone: 317-398-4434
CAGE: 64591

=====
Composition/Information on Ingredients
=====

Ingred Name: FIBROUS GLASS
CAS: 65997-17-3
Fraction by Wt: 92-100%
Other REC Limits: 3 FIBERS/CC (MFR)
OSHA PEL: 5 MG/M3 RDUST (MFR)
ACGIH TLV: 10 MG/M3 TDUST

Ingred Name: PHENOL FORMALDEHYDE RESIN CURED; (PHENOLIC RESIN-CURED)
CAS: 25104-55-6
Fraction by Wt: 0-8%

Ingred Name: SUPP DATA: WOOL CAUSED CANCER IN HUMANS. HOWEVER, IARC DOES
REGARD IT PRUDENT TO TREAT ANY MATL FOR WHICH THERE (ING 4)
RTECS #: 9999999ZZ

Ingred Name: ING 3: IS SUFFICIENT EVIDENCE OF CARCIN IN ANIMALS AS IF IT
WERE A POSS CARCIN TO HUMANS. SKIN: ACUTE: TRANSIENT (ING 5)
RTECS #: 9999999ZZ

Ingred Name: ING 4: MECH IRRIT. SKIN ABSORPTION DOES NOT OCCUR. CHRONIC:
NONE KNOWN. EYES: ACUTE: DIRECT CONT WILL CAUSE MECH (ING 6)
RTECS #: 9999999ZZ

Ingred Name: ING 5: IRRITATION. CHRONIC: NONE KNOWN.
RTECS #: 9999999ZZ

=====
Hazards Identification
=====

Material Safety Data Sheets, Carver Hall RM 208-A

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: MECH IRRIT OF MOUTH/NOSE/THROAT. CHRONIC: IARC CLASSIFIED FIBER GLASS WOOL AS POSS CANCER CAUSING AGENT TO HUMANS. THIS CLASSIFICATION WAS SUBSTANTIALLY BASED ON EXPTS IN WHICH FIBER GL ASS WOOL WAS INJECTED/IMPLANTED IN ANIMALS. HOWEVER, ANIMAL INHAL STUDIES W/EXPOS TO LGE QTYS OF GLASS (SUPP DATA)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:ITCHING AND IRRITATION OF UPPER RESPIRATORY TRACT.

Medical Cond Aggravated by Exposure:PRE-EXISTING UPPER RESPIRATORY & LUNG DISEASES MAY BE AGGRAVATED BY DUST. THE PRODUCT IS A MECHANICAL IRRITANT FOR SKIN, EYES AND UPPER RESPIRATORY SYSTEM.

===== First Aid Measures =====

First Aid:INHAL: REMOVE TO FRESH AIR. DRINK WATER TO CLEAR THROAT & BLOW NOSE TO EVACUATE FIBERS. SKIN: FREQUENT RINSING OF SKIN SURFACE W/WATER TO REMOVE ACCUMULATED FIBERS WILL MINIMIZE IRRIT. IF IRRIT PERSIS TS CONSULT MD. TREAT AS A MECHANICAL IRRITANT. EYES: FLUSH W/FLOWING WATER FOR AT LEAST 15 MIN. INGEST: CALL MD IMMEDIATELY .

===== Fire Fighting Measures =====

Extinguishing Media:WATER, FOAM, DRY CHEMICAL, CO*2.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:RESIN WILL BURN CAUSING DENSE ACRID SMOKE.

===== Accidental Release Measures =====

Spill Release Procedures:DUST RELEASE FROM INSULATION - VACUUM CLEAN DUST. USE A DUST SUPPRESSANT IF SWEEPING IS NECESSARY.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:KEEP MATERIAL DRY & MINIMIZE GENERATION OF DUST.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPRVD DISPOSABLE MASK DESIGNED FOR NUISANCE TYPE DUSTS SUCH AS 3M MODEL 9900 OR ITS EQUIVALENT.

Ventilation:USE SUFFICIENT NATURAL OR MECHANICAL VENTILATION TO MAINTAIN AIRBORNE DUST CONCENTRATION BELOW TLV.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:CHEM WORK GOGG/FULL LENGTH FSHLD .

Other Protective Equipment:WEAR LONG-SLEEVED, LOOSE FITTING CLOTHING, & HEAD COVERING.

Work Hygienic Practices:WASH WORK CLOTHES SEPARATELY FROM OTHER CLOTHING TO PREVENT GLASS FIBER MIGRATION. RINSE WASHER THOROUGHLY.

Material Safety Data Sheets, Carver Hall RM 208-A

Supplemental Safety and Health

HAZ DECOMP PROD: HYDROGEN CYANIDE DERIVED FROM PYROLYSIS OF RESIN. HLTH
HAZ: OF GLASS FIBER HAVE NOT DEMONSTRATED AN ASSOC BETWEEN GLASS
FIBERS & LUNG CANCER. ADDITIONALLY, LGE SCALE HUMAN MORTALITY S
TUDIES OF U.S. & EUROPEAN FIBER GLASS WOOL FACTORY WORKERS DID NOT
PROVIDE CONCLUSIVE EVIDENCE THAT FIBER GLASS (ING 3)

===== Physical/Chemical Properties =====

Spec Gravity:VARIABLE
Solubility in Water:INSOLUBLE
Appearance and Odor:YELLOW OR WHITE INSULATION; NO APPRECIABLE ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
HYDROFLUORIC ACID WILL DISSOLVE THE GLASS.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:BINDER DECOMPOSES IN FIRE. DECOMP
PRODS ARE CARBON MONOXIDE, CARBON DIOXIDE, CARBON PARTICULATE &
TRACES OF (SUPP DATA)

===== Disposal Considerations =====

Waste Disposal Methods:FIBROUS GLASS IS GENERALLY CLASSIFIED AS
NON-HAZARDOUS WASTE & DISPOSAL MAY BE IN LANDFILL FOR NON-CRITICAL
MATLS. LOCAL, STATE, OR FEDERAL REGULATIONS SHOULD BE CONSULTED.
THIS MATL IS NOT REGULATED UNDER RCRA HAZARDOUS WASTE REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet
L-(-)-Glucose, 98%

ACC# 83591

Section 1 - Chemical Product and Company Identification

MSDS Name: L-(-)-Glucose, 98%

Catalog Numbers: AC241920000, AC241920010, AC241922500

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
921-60-8	L-(-)-Glucose	98	213-068-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.

Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: ; Flammability: ; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Material Safety Data Sheets, Carver Hall RM 208-A

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
L-(-)-Glucose	none listed	none listed	none listed

OSHA Vacated PELs: L-(-)-Glucose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 153.00 - 156.00 deg C

Decomposition Temperature: Not available.

Solubility: soluble

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₂O₆

Molecular Weight: 180.16

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, strong oxidants.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 921-60-8: LZ6610000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 921-60-8: 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

Material Safety Data Sheets, Carver Hall RM 208-A

	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# 921-60-8 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.

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# 921-60-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Material Safety Data Sheets, Carver Hall RM 208-A

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# 921-60-8: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section

Material Safety Data Sheet

D-Glycogen

ACC# 00698

Section 1 - Chemical Product and Company Identification

MSDS Name: D-Glycogen

Catalog Numbers: AC422950000, AC422950050

Synonyms: Animal starch; Liver starch.

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
9005-79-2	D-Glycogen	ca. 100	232-683-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause irritation of the digestive tract. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Material Safety Data Sheets, Carver Hall RM 208-A

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. No special precautions indicated.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-Glycogen	none listed	none listed	none listed

OSHA Vacated PELs: D-Glycogen: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: none reported

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Decomposes

Freezing/Melting Point: 255 deg C

Decomposition Temperature: > 255 deg C

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: C₆H₁₀O₅N

Molecular Weight: 176.0737

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Material Safety Data Sheets, Carver Hall RM 208-A

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 9005-79-2: MC2700000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 9005-79-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
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Material Safety Data Sheets, Carver Hall RM 208-A

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# 9005-79-2 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# 9005-79-2 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:

Material Safety Data Sheets, Carver Hall RM 208-A

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 9005-79-2: 1

Canada - DSL/NDSL

CAS# 9005-79-2 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

Hydrogen Peroxide 3%

ACC# 40069

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrogen Peroxide 3%

Catalog Numbers: H312-4, H312-500, H312P-4, H312SAM1, H312SAM2, H312SAM3, H324-500, NC9472802, NC9950148, S93263

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
7732-18-5	Water	97	231-791-2
7722-84-1	Hydrogen peroxide	3.0	231-765-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Clear liquid.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. Vapors may cause eye irritation.

Skin: May cause skin irritation. May cause skin discoloration. May cause reddening of the skin.

Ingestion: May cause irritation of the digestive tract. May lead to distention of the esophagus and stomach.

Inhalation: May cause respiratory tract irritation. Irritation may lead to chemical pneumonitis and

Material Safety Data Sheets, Carver Hall RM 208-A

pulmonary edema.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: 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. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Use flooding quantities of water as spray.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; 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. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store 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
Water	none listed	none listed	none listed
Hydrogen peroxide	1 ppm TWA	1 ppm TWA; 1.4 mg/m ³ TWA 75 ppm IDLH	1 ppm TWA; 1.4 mg/m ³ TWA

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Hydrogen peroxide: 1 ppm TWA; 1.4 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

Odor: slight

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: >1.00

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: > 100 deg C

Freezing/Melting Point:Not available.

Decomposition Temperature:Not available.

Solubility: Soluble.

Specific Gravity/Density: >1.000

Molecular Formula:Solution

Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Decomposes slowly to release oxygen.

Conditions to Avoid: Incompatible materials, light, ignition sources, metals, excess heat, reducing agents, alkaline materials, oxidizers, temperatures above 300°C.

Incompatibilities with Other Materials: Hydrogen peroxide is incompatible with acetal + acetic acid, acetaldehyde + desiccants, acetic acid, acetic acid + N-heterocycles, acetic acid + 3-thioethanol, acetic anhydride, acetone, alcohols, alcohols + sulfuric acid, aluminum isopropoxide + heavy metal salts, 2-amino-4-methyloxazole, aromatic hydrocarbons + trifluoroacetic acid, azalaic acid + sulfuric acid, benzenesulfonic anhydride, tert-butanol + sulfuric acid, carboxylic acids, carbon, coal, diethyl ether, 3,5-dimethyl-3-hexanol + sulfuric acid, dimethylphenylphosphine, diphenyl diselenide, 2-ethoxyethanol + polyacrylamide + toluene, ethyl acetate, formic acid + metaboric acid, gadolinium hydroxide, gallium + hydrochloric acid, hydrogen + palladium catalyst, hydrogen selenide, iron (III) sulfate + 2-methylpyridine + sulfuric acid, iron (II) sulfate + nitric acid + sodium carboxymethylcellulose, ketene, ketones + nitric acid, lead + trioxane, lithium tetrahydroaluminate, mercury (II) oxide + nitric acid, metals, metal oxides or metal salts, methanol + tert-amine + platinum catalyst, methanol + phosphoric acid, 4-methyl-2,4,6-triazatricyclo-undeca-8-ene-3,5dione + potassium hydroxide, nitric acid + soils, nitric acid + thiourea, nitrogenous bases, organic compounds, organic materials + sulfuric acid, oxygenated compounds, 2-phenyl-1,1-dimethylethanol + sulfuric acid, alpha-phenylselenoketones, phosphorus, phosphorus (V) oxide, poly(acetoxyacrylic acid lactone) + poly(2-hydroxyacrylic acid), sulfuric acid, tetrahydrothiophene, tin(II) chloride, unsaturated compounds, and vinyl acetate.

Hazardous Decomposition Products: Nitrogen oxides, hydrogen gas, oxygen, hydrazoic acid.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 7722-84-1: MX0887000; MX0888000; MX0890000; MX0899000; MX0899500; MX0900000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 7722-84-1:

Draize test, rabbit, eye: 1 mg Severe;

Inhalation, rat: LC50 = 2 gm/m³/4H;

Inhalation, rat: LC50 = 2000 mg/m³;

Oral, mouse: LD50 = 2000 mg/kg;

Oral, rabbit: LD50 = 820 mg/kg;

Oral, rat: LD50 = 1518 mg/kg;

Oral, rat: LD50 = 910 mg/kg;

Oral, rat: LD50 = 376 mg/kg;

Oral, rat: LD50 = 4050 mg/kg;

Skin, rat: LD50 = 3 gm/kg;

Skin, rat: LD50 = 4060 mg/kg;

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Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7722-84-1:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** Not listed.
- **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: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 7722-84-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

CAS# 7722-84-1: 1000 lb TPQ (concentration >52%)

SARA Codes

CAS # 7722-84-1: 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:

CAS# 7722-84-1 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# 7722-84-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

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WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 7722-84-1: 0

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 7722-84-1 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# 7722-84-1 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Iodine solution

ACC# 89222

Section 1 - Chemical Product and Company Identification

MSDS Name: Iodine solution

Catalog Numbers: BP2707-250, BP2707-60, BP2707-60A, BP2707-60C, BP2707250, BP270760, BP2710-1G, BP2710-250, BP2710250, BP27104, 2300584, 2300585, 23281407B, 66770

Synonyms: Mixture.

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	Deionized water	>85	231-791-2
25655-41-8	Poyl(vinylpyrrolidone)-iodine complex	<13	unlisted
7681-11-0	Potassium iodide	1.9	231-659-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: dark red-brown liquid.

Warning! Eye contact may result in permanent eye damage. May cause allergic skin reaction. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. May cause fetal effects based upon animal studies.

Target Organs: Thyroid.

Potential Health Effects

Eye: Causes eye irritation and possible injury.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident

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upon re-exposure to this material.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: Causes respiratory tract irritation.

Chronic: Chronic exposure can lead to iodism characterized by headache, excess salivation, nasal discharge, conjunctivitis, laryngitis, bronchitis, stomatitis, enlarged submaxillary glands, and skin rashes. May interfere with iodine uptake of the thyroid gland and enlarge it. 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: 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. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid 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. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: 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: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable

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container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: 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
Deionized water	none listed	none listed	none listed
Poyl(vinylpyrrolidone)-iodine complex	none listed	none listed	none listed
Potassium iodide	none listed	none listed	none listed

OSHA Vacated PELs: Deionized water: No OSHA Vacated PELs are listed for this chemical.

Poyl(vinylpyrrolidone)-iodine complex: No OSHA Vacated PELs are listed for this chemical. Potassium iodide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to 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: dark red-brown

Odor: Iodine

pH: Not available.

Vapor Pressure: Not available.

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Vapor Density: >1.00

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 100 deg C

Freezing/Melting Point: > 0 deg C

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: ~1

Molecular Formula: Solution

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat.

Incompatibilities with Other Materials: Incompatibilities with potassium iodide include: salts of alkaloids, chloral hydrate, calomel(mercurous chloride) potassium chlorate, metallic salts, tartaric and other acids, bromine trifluoride, and fluorine perchlorate, oxidizing agents. Incompatibilities with PVP include oxidizing agents.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, oxides of potassium, iodine.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 25655-41-8: TR1579600

CAS# 7681-11-0: TT2975000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 25655-41-8:

Draize test, rabbit, skin: 500 mg Mild;

Oral, mouse: LD50 = 8100 mg/kg;

Oral, rat: LD50 = >8 gm/kg;

CAS# 7681-11-0:

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 25655-41-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7681-11-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

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Epidemiology: Experimental reproductive effects have been reported.

Teratogenicity: Iodine salts can produce deformity, illness, and death of a fetus. PVP(iodine complex) has been shown to present a possible risk of harm to the unborn child.

Reproductive Effects: PVP(iodine complex) has been shown to produce reproductive effects when there is overexposure.

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# 7732-18-5 is listed on the TSCA inventory.

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CAS# 25655-41-8 is listed on the TSCA inventory.

CAS# 7681-11-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7681-11-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 25655-41-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7681-11-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 25655-41-8: 2

CAS# 7681-11-0: 1

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 25655-41-8 is listed on Canada's DSL List.

CAS# 7681-11-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

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This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7681-11-0 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

Material Safety Data Sheet

Iron(II) sulfate heptahydrate

ACC# 00638

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron(II) sulfate heptahydrate

Catalog Numbers: AC201390000, AC201390010, AC201390050, AC201392500, AC423730000, AC423730030 AC423730030, AC423730050, AC423735000

Synonyms: Ferrous sulfate heptahydrate.

Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7782-63-0	Iron(II) sulfate heptahydrate	99+	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: blue crystals.

Warning! Harmful if swallowed. Causes eye and skin irritation. May cause respiratory tract irritation.

Target Organs: Blood, kidneys, central nervous system, liver, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

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Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause nausea and vomiting.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: May cause liver and kidney damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects. Exposure to high concentrations may cause central nervous system depression. Animal studies have reported the development of tumors. Oral doses of 960 mg/kg given intermittently over a 9 week period produced jaundice in

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

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Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Iron(II) sulfate heptahydrate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed
Ferrous sulfate anhydrous	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Iron(II) sulfate heptahydrate: No OSHA Vacated PELs are listed for this chemical. Ferrous sulfate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

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Physical State: Crystals

Appearance: light green - blue

Odor: odorless

pH: 3 - 4 (5% aq.sol.(20°C))

Vapor Pressure: 14.6 mm Hg @ 25 deg C

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 300 deg C (dec)

Freezing/Melting Point:64 deg C

Decomposition Temperature:400 deg C

Solubility: 25.6 g/100mL (20°C)

Specific Gravity/Density:Not available.

Molecular Formula:FeSO₄.7H₂O

Molecular Weight:278.01

Section 10 - Stability and Reactivity

Chemical Stability: Air sensitive. Moisture sensitive.

Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.

Hazardous Decomposition Products: Oxides of sulfur, oxides of iron.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7782-63-0: NO8510000

CAS# 7720-78-7: NO8500000

LD50/LC50:

CAS# 7782-63-0:

Oral, mouse: LD50 = 1520 mg/kg;

CAS# 7720-78-7:

Oral, mouse: LD50 = 680 mg/kg;

Oral, rat: LD50 = 319 mg/kg;

Oral, rat: LD50 = 533 mg/kg;

For Iron(II) sulfate (1:1), heptahydrate (CAS = 7782-63-0): Oral rat LDLo: 1389 mg/kg, Oral rabbit LDLo: 2778 mg/kg. For Iron(II) sulfate anhydrous (CAS = 7720-78-7): Child Oral LDLo: 435 mg/kg

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Coma, BP lowering not characterized in autonomic section, jaundice.

Carcinogenicity:

CAS# 7782-63-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7720-78-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Tumorigenic effects have been reported in experimental animals.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7782-63-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7720-78-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7782-63-0: 1000 lb final RQ (listed under Ferrous sulfate); 454 kg final RQ (listed under F

CAS# 7720-78-7: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7782-63-0: immediate.

CAS # 7720-78-7: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7782-63-0 is listed as a Hazardous Substance under the CWA. CAS# 7720-78-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7782-63-0 can be found on the following state right to know lists: California, (listed as Iron salts (soluble)), Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

CAS# 7720-78-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Material Safety Data Sheets, Carver Hall RM 208-A

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

Safety Phrases:

S 46 If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 7782-63-0: No information available.

CAS# 7720-78-7: 1

Canada - DSL/NDSL

CAS# 7720-78-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7782-63-0 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

CAS# 7720-78-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Iron(III)sulfate pentahydrate

ACC# 01891

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron(III)sulfate pentahydrate

Catalog Numbers: AC345230000, AC345230050, AC345235000

Synonyms: None known.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
142906-29-4	Iron(III)sulfate pentahydrate	97%	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to yellow-green crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Material Safety Data Sheets, Carver Hall RM 208-A

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Iron(III)sulfate pentahydrate	none listed	none listed	none listed
Iron(III) sulfate	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	1 mg/m ³ TWA (as Fe) (listed under Iron salts (soluble)).	none listed

OSHA Vacated PELs: Iron(III)sulfate pentahydrate: No OSHA Vacated PELs are listed for this chemical. Iron(III) sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: yellow to yellow-green

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density: Not available.
Molecular Formula: Fe₂O₁₂S₃.5H₂O
Molecular Weight: 489.94

Section 10 - Stability and Reactivity

Chemical Stability: Light sensitive. Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Incompatible materials, light, dust generation, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Oxides of sulfur.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 142906-29-4 unlisted.
CAS# 10028-22-5: NO8505000
LD50/LC50:
Not available.
Not available.

Carcinogenicity:
CAS# 142906-29-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 10028-22-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutation in microorganisms: See actual entry in RTECS for complete information.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information available.

Material Safety Data Sheets, Carver Hall RM 208-A

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 142906-29-4 is not listed on the TSCA inventory. It is for research and development use only.

CAS# 10028-22-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 10028-22-5: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10028-22-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 142906-29-4 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 10028-22-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Iron salts (soluble)), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 142906-29-4: No information available.

CAS# 10028-22-5: 1

Canada - DSL/NDSL

CAS# 10028-22-5 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 10028-22-5 (listed as Iron salts (soluble)) is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Inform

Material Safety Data Sheets, Carver Hall RM 208-A

ALDON CORP. -- IRON METAL FILINGS --

==== Product Identification =====

Product ID:IRON METAL FILINGS
MSDS Date:12/10/1996
FSC:NIIN:Submitter:D DG
Status Code:A
MSDS Number: CKBTG
=== Responsible Party ===
Company Name:ALDON CORP.
Address:1533 W HENRIETTA RD
City:AVON
State:NY
ZIP:14414
Country:US
Info Phone Num:716-226-6177
Emergency Phone Num:716-226-6177
Resp. Party Other MSDS Num.:IX 210
Preparer's Name:MICHAEL RASZEJA
Chemtrec Ind/Phone:(800)424-9300
CAGE:6V042

==== Contractor Identification =====

Company Name:AL-DON CHEMICALS INC
Address:1533 W HENRIETTA RD
Box:City:AVON
State:NY
ZIP:14414-9508
Country:US
Phone:716-226-6177
CAGE:6V042
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
Contract Num:MDA414-99-A-0024-0023
CAGE:63759

==== Composition/Information on Ingredients =====

Ingred Name:IRON METAL
CAS:7439-89-6
RTECS #:NO4565500
= Wt:100.

==== Hazards Identification =====

Health Hazards Acute and Chronic:IRON DUST IS A SKIN, EYE AND MUCOUS MEMBRANE IRRITANT, CAN CAUSE IRRITATION AND INFLAMMATION OF THE EYES AND LUNGS. EXERCISE APPROPRIATE PROCEDURES TO MINIMIZE POTENTIAL HAZARDS.

==== First Aid Measures =====

Material Safety Data Sheets, Carver Hall RM 208-A

First Aid:EYES-FLUSH THOROUGHLY WITH WATER FOR AT LEAST 15, LIFTING LOWER AND UPPER EYELIDS OCCASIONALLY.IF IRRITATION DEVELOPS OR PERSISTS, GET MEDICAL ATTENTION. SKIN-FLUSH WITH WATER, THEN WASH WITH SOAP AN D WATER. INHALATION AS DUST-REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT. GIVE OXYGEN. IF SYMPTOMS OF ILLNESS DEVELOPS, GET MEDICAL ATTENTION.

===== Fire Fighting Measures =====

Extinguishing Media:USE ANY MEDIA SUITABLE FOR EXTINGUISHING SUPPORTING FIRE.

Fire Fighting Procedures:WEAR A NIOSH/MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS

Unusual Fire/Explosion Hazard:A FIRE HAZARD IN THE FORM OF A FINE DUST OR BY CHEMICAL REACTION WITH STRONG OXIDIZERS.

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP FOR RECYCLING OR PLACE IN A SUITABLE CONTAINER FOR DISPOSAL.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY PLACE AWAY FROM ACIDS AND OXIDIZERS. WASH THOROUGHLY AFTER HANDLING. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE.

Other Precautions:READ LABEL ON CONTAINER BEFORE USING. DO NOT WEAR CONTACT LENSES WHEN WORKING WITH CHEMICALS. FOR LABORATORY USE ONLY. NOT FOR DRUG, FOOD OR HOUSEHOLD USE. KEEP OUT OF REACH OF CHILDREN. REMOVE & WASH CONTAMINATED CLOTHING.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE SHOULD BE NEEDED IN NORMAL HANDLING. IF DUSTY CONDITIONS PREVAIL, WEAR A NIOSH/MSHA-APPROVED DUST MASK OR RESPIRATOR.

Ventilation:LOCAL EXHAUST: RECOMMENDED. MECHANICAL (GENERAL): IF DUSTY. Protective Gloves:NONE NEEDED.

Eye Protection:CHEMICAL SAFETY GLASSES.

Other Protective Equipment:GOGGLES, EYE WASH STATION, LAB COAT.

Work Hygienic Practices:REMOVE AND WASH CONTAMINATED CLOTHING. WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:N1

Boiling Pt:=1535.C, 2795.F

Melt/Freeze Pt:=3000.C, #####F

Vapor Pres:1 MM AT 1787C

Vapor Density:1.93

Spec Gravity:7.86

Solubility in Water:INSOLUBLE.

Appearance and Odor:GRAY-BLACK GRANULATED OR POWDER; NO ODOR.

Percent Volatiles by Volume:NEGLIGIBLE

Material Safety Data Sheets, Carver Hall RM 208-A

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
STRONG OXIDIZERS, ACIDS. REACTS VIOLENTLY WITH CL₂, CIF₂, F₂, H₂O_S,
NO₂, P, H₂SO₄.
Stability Condition to Avoid: OXIDIZES READILY IN MOIST AIR.
Hazardous Decomposition Products: NONE.

===== Toxicological Information =====

Toxicological Information: TLV: NONE ESTABLISHED.

===== Disposal Considerations =====

Waste Disposal Methods: DISCHARGE, TREATMENT OR DISPOSAL MAY BE SUBJECT
TO FEDERAL, STATE OR LOCAL LAWS. THESE GUIDELINES ARE INTENDED FOR
THE DISPOSAL OF CATALOG-SIZE QUANTITIES ONLY. UNCONTAMINATED
MATERIALS MAY BE DISPOSE D OF IN A SANITARY LANDFILL.

===== MSDS Transport Information =====

Transport Information: NON REGULATED.

===== Other Information =====

Disclaimer (provided with this information by the compiling agencies):
This information is formulated for use by elements of the Department
of Defense. The United States of America in no manner whatsoever,
expressly or implied, warrants this information to be accurate and
disclaims all liability for its use. Any person utilizing this
document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Iron Metal Filings, Fine

ACC# 89410

Section 1 - Chemical Product and Company Identification

MSDS Name: Iron Metal Filings, Fine

Catalog Numbers: I57-500

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
7439-89-6	Iron Metal	100.0	231-096-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black to gray solid.

Warning! Flammable solid. May cause mechanical eye and skin irritation. May cause blood abnormalities. May cause lung damage. Inhalation of fumes may cause metal-fume fever. May cause cardiac disturbances. May cause liver damage. Moisture sensitive.

Target Organs: Liver, respiratory system, cardiovascular system, pancreas.

Potential Health Effects

Eye: Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities. Deposition of particles may cause corneal discoloration.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Acute toxicity may include weakness, shock, cyanosis and acidosis. Delayed symptoms may include liver

Inhalation: Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms

Material Safety Data Sheets, Carver Hall RM 208-A

with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause lung damage.

Chronic: Chronic exposure may lead to liver and lung damage. Repeated exposure may cause pancreatic damage, diabetes, and cardiac abnormalities. Chronic exposure may lead to chronic bronchitis and a benign pneumoconiosis (siderosis).

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: 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 Deferoxamine as a chelating agent should be determined only by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes. Flammable solid.

Extinguishing Media: Use only graphite powder, soda ash, powdered sodium chloride, or an appropriate metal-fire-extinguishing dry powder.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: 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.

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
Iron Metal	none listed	none listed	none listed

OSHA Vacated PELs: Iron Metal: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: black to gray

Odor: none reported

pH: Not available.

Vapor Pressure: 1 mm Hg @ 1787 deg C

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 2750 deg C

Freezing/Melting Point: 1535 deg C

Material Safety Data Sheets, Carver Hall RM 208-A

Decomposition Temperature: Not available.

Solubility: Insoluble in water.

Specific Gravity/Density: 7.86 @ 20°C

Molecular Formula: Fe

Molecular Weight: 55.847

Section 10 - Stability and Reactivity

Chemical Stability: Decomposes when heated. Oxidizes when exposed to air.

Conditions to Avoid: Incompatible materials, moisture, exposure to air, excess heat.

Incompatibilities with Other Materials: Acetaldehyde, ammonium peroxodisulfate, chloroformamidinium, chloric acid, ammonium nitrate, halogens, dinitrogen tetroxide, nitryl fluoride, polystyrene, sodium acetylde, potassium dichromate, peroxyformic acid, nitryl fluoride, sulfuric acid, sodium carbide, strong oxidizers, phosphorous, halogens.

Hazardous Decomposition Products: Oxides of iron.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7439-89-6: NO4565500; NO8225000

LD50/LC50:

CAS# 7439-89-6:

Oral, rat: LD50 = 30 gm/kg;

Carcinogenicity:

CAS# 7439-89-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	METAL POWDERS, FLAMMABLE, N.O.S.	METAL POWDER FLAMMABLE NOS (IRON)
Hazard Class:	4.1	4.1
UN Number:	UN3089	UN3089
Packing Group:	II	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7439-89-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7439-89-6: immediate, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

Material Safety Data Sheets, Carver Hall RM 208-A

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7439-89-6 can be found on the following state right to know lists: California.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

F

Risk Phrases:

R 11 Highly flammable.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

WGK (Water Danger/Protection)

CAS# 7439-89-6: 0

Canada - DSL/NDSL

CAS# 7439-89-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4.

This product has been classified in accordance with 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 Sheets, Carver Hall RM 208-A

JOHNSON MATTHEY -- IRON WIRE, 10937 -- 9545-00N067144

=====
Product Identification
=====

Product ID:IRON WIRE, 10937
MSDS Date:01/18/1988
FSC:9545
NIIN:00N067144
MSDS Number: CBWNX
=== Responsible Party ===
Company Name:JOHNSON MATTHEY
Address:30 BOND ST
City:WARD HILL
State:MA
ZIP:01835-0747
Country:US
Info Phone Num:508-521-6300
Emergency Phone Num:800-424-9300 (CHEMTREC)
CAGE:0JVJ1

==== Contractor Identification ====
Company Name:JOHNSON MATTHEY CATALOG CO INC ALFA AESAR
Address:30 BOND ST
Box:City:WARD HILL
State:MA
ZIP:01835-0747
Country:US
Phone:978-521-6300
CAGE:0JVJ1

=====
Composition/Information on Ingredients
=====

Ingred Name:IRON
CAS:7439-89-6
RTECS #:NO4565500
Fraction by Wt: 100%
OSHA PEL:N/K
ACGIH TLV:N/K

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:NO Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:INGEST:NONE KNOWN. SKIN:MAY
CAUSE IRRITATION. EYE:DUST CAN CAUSE CONJUNCTIVITIS, CHOROIDITIS,
RETINITIS & SIDEROSIS OF TISSUES IF IRON REMAINS IN THESE TISSUES.
INHALATION:POWDER OR DUST MAY CAUSE IRRITATION, PULMONARY
FIBROSIS. CHRONIC:NONE KNOWN.
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:PRE-EXISTING RESPIRATORY
CONDITIONS.

=====
First Aid Measures
=====

First Aid:INGEST:CALL MD IMMED . NO DATA AVAIL BUT ONE SHOULD OBTAIN
MED ATTN. INHAL:REMOVE TO FRESH AIR. SUPPORT BRTHG (GIVE O*2/ARTF
RESP) . NO DATA AVAIL BUT ONE SHOULD OBTAIN MED ATTN. SKIN:REMO VE
CONTAM CLTHG, FLOOD SKIN W/LG AMTS OF WATER. IF IRRIT PERSISTS,

Material Safety Data Sheets, Carver Hall RM 208-A

SEEK MED ATTN. EYES:IMMED FLUSH EYES, INCLUDING UNDER LIDS, W/LG AMTS OF WATER FOR @ LST 15 MIN. CALL MD.

===== Fire Fighting Measures =====

Extinguishing Media:FLAM IN POWDERED FORM. MAY BE PYROPHORIC. DO NOT USE WATER, CO*2/HALOGENATED EXTINGS. USE SPECIAL MIXS OF DRY (SUP DAT)

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT . IF WITHOUT RISK, REMOVE MATERIAL FROM FIRE AREA. COOL CONTAINER WITH WATER FROM MAX DIST.

Unusual Fire/Explosion Hazard:NONE SPECIFIED BY MANUFACTURER.

===== Accidental Release Measures =====

Spill Release Procedures:WEARING FULL PROTECTIVE EQUIPMENT, COVER SPILL WITH DRY SAND OR VERMICULITE. MIX WELL AND CAREFULLY TRANSFER TO A CONTAINER.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER TIGHTLY CLOSED. STORE IN A COOL, DRY, WELL-VENTILATED AREA.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED HIGH EFFICIENCY PARTICLE RESPIRATOR.

Ventilation:GLOVE BAG OR BOX WITH A DRY INERT ATMOSPHERE FOR FINE POWDERS. LABORATORY FUME HOOD FOR SOLID FORMS.

Protective Gloves:RUBBER GLOVES.

Eye Protection:ANSI APPROVED CHEM WORKERS GOGGS .

Other Protective Equipment:ANSI APPRVD EMER EYEWASH & DELUGE SHOWER . LAB COAT & APRON, FLAME & CHEM RESIST COVERALLS, & HYGIENIC (SUPP DATA)

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

EXTING MEDIA:CHEMICAL EXTINGUISHING AGENTS, POWDERED GRAPHITE, DRY SAND OR DOLOMITE. MATLS TO AVOID:WITH WATER CAN PRODUCE HYDROGEN. REACTS VIOLENTLY WITH H*2O*2. FINELY DIVIDED FRESHLY REDUCED IRON P OWDER IS PYROPHORIC AND IGNITES ON EXPOSURE TO AIR AT NORMAL TEMPERATURE. OTHER PROT EQUIP:FACILITIES FOR WASHING.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:5432F,3000C

Melt/Freeze Pt:M.P/F.P Text:2797F,1536C

Vapor Pres:1 @ 1787C

Spec Gravity:7.87 (H*2O=1)

Evaporation Rate & Reference:0 (BUTYL ACETATE=1)

Solubility in Water:INSOLUBLE

Appearance and Odor:SILVERY-WHITE OR GREY METAL, BLACK TO GREY POWDER, ODORLESS.

Percent Volatiles by Volume:0

===== Stability and Reactivity Data =====

Material Safety Data Sheets, Carver Hall RM 208-A

Stability Indicator/Materials to Avoid: YES

OXIDIZING MATLS, HALOGENS, ACIDS, H₂O₂, NO₂, POLYSTYRENE, P, CLF₃,
NA₂ C₂, WATER, MOIST AIR. OTHER: RXN (SUPP DATA)

Stability Condition to Avoid: INCOMPATIBLES, FOR FINE POWDERS AVOID
HEAT, SPARKS, FLAMES.

Hazardous Decomposition Products: FE₂O₃, H₂.

===== Disposal Considerations =====

Waste Disposal Methods: CONSULT STATE, LOCAL OR FEDERAL EPA REGULATIONS
FOR PROPER DISPOSAL.

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Material Safety Data Sheets, Carver Hall RM 208-A

J.T.BAKER CHEMICAL CO -- FERRIC CHLORIDE,HEXAHYDRATE -- 6810-00-241-1164

=====
Product Identification
=====

Product ID:FERRIC CHLORIDE,HEXAHYDRATE
MSDS Date:03/09/1992
FSC:6810
NIIN:00-241-1164
MSDS Number: BDMKX
=== Responsible Party ===
Company Name:J.T.BAKER CHEMICAL CO
Address:222 RED SCHOOL LANE
City:PHILLIPSBURG
State:NJ
ZIP:08865
Country:US
Info Phone Num:800-JTBAKER
Emergency Phone Num:201-859-2151/800-424-9300 (CHEMTR)
CAGE:DO870

==== Contractor Identification ====

Company Name:J.T.BAKER CHEMICAL CO.
Address:222 RED SCHOOL LANE
City:PHILLIPSBURG
State:NJ
ZIP:08865-2219
Country:US
Phone:201-859-2151
CAGE:DO870

Company Name:MALLINCKRODT BAKER, INC.
Address:222 RED SCHOOL LANE
Box:City:PHILLIPSBURG
State:NJ
ZIP:08865
Country:US
Phone:800-582-2537
CAGE:70829

=====
Composition/Information on Ingredients
=====

Ingred Name: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 IRRITATION OR BURNS. HARMFUL IF SWALLOWED, MAY CAUSE BURNS
TO MOUTH, AND THROAT. CHRONIC:LIVER DAMAGE.
Effects of Overexposure:EYES: REDNESS, PAIN, BURNS. SKIN:IRRITATION,
BURNS. INHALATION: SEVERE RESPIRATORY TRACT IRRITATION, SORE
THROAT, COUGH, LABORED BREATHING. INGESTION: ABDOMINAL PAIN,
NAUSEA, VOMITING, DIARRHEA, GI IRRITATION.

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Medical Cond Aggravated by Exposure:NONE IDENTIFIED.

===== First Aid Measures =====

First Aid:EYES: FLUSH WITH WATER FOR AT LEAST 15 MIN. SEE DOCTOR. SKIN:
REMOVE CONTAMINATED CLOTHING, WASH WITH SOAP AND WATER FOR AT LEAST
15 MIN. SEE DOCTOR. INHALATION:REMOVE TO FRESH AREA. GIVE
OXYGEN/CPR I F NEEDED. SEE DOCTOR. INGESTION:DRINK LARGE AMOUNTS OF
WATER, INDUCE VOMITING IF CONSCIOUS. GET MEDICAL HELP IMMEDIATELY.

===== Fire Fighting Measures =====

Extinguishing Media:USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY
CHEMICAL.
Fire Fighting Procedures:FIRE FIGHTERS SHOULD WEAR PROTECTIVE CLOTHING
AND SELF-CONTAINED BREATHING APPARATUS.
Unusual Fire/Explosion Hazard:FIRE OR EXCESSIVE HEAT MAY CAUSE
PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS., ESPECIALY TOXIC
HYDROGEN CHLORIDE GAS.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR PROTECTIVE EQUIPMENT, WITH CLEAN SHOVEL
PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER. FLUSH AREA WITH
WATER.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN COOL, DRY, WELL VENTILATED
AREA. KEEP CONTAINERS TIGHTLY CLOSED. CODE: ORANGE.
Other Precautions:DO NOT CREATE DUST, AVOID CONTACT.

===== 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 VENTILATION TO MAINTAIN
EXPOSURE LEVEL BELOW TLV.
Protective Gloves:PROTECTIVE GLOVES.
Eye Protection:GOGGLES
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:=280.C, 536.F
Melt/Freeze Pt:=36.7C, 98.F
Spec Gravity:1.82
Solubility in Water:91.9%
Appearance and Odor:YELLOW BROWN TO ORANGE CRYSTALS, VERY DELIQUESCENT.

===== Stability and Reactivity Data =====

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Stability Indicator/Materials to Avoid: YES

SODIUM, POTASSIUM, MINERAL ACIDS, COMMON METALS, STRONG BASES.

Stability Condition to Avoid: MOISTURE, LIGHT AND HEAT.

Hazardous Decomposition Products: TOXIC AND CORROSIVE FUMES OF HYDROGEN CHLORIDE GAS AND OR 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: KEEP IN COVERED CONTAINERS PENDING DISPOSAL.

DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

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FISHER SCIENTIFIC, CHEMICAL DIV. -- FERROUS CHLORIDE TETRAHYDRATE -- 6810-00-857-7636

=====
Product Identification
=====

Product ID:FERROUS CHLORIDE TETRAHYDRATE
MSDS Date:12/19/1991
FSC:6810
NIIN:00-857-7636
MSDS Number: BNQCF
=== 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: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 (II) CHLORIDE TETRAHYDRATE
CAS:13478-10-9
RTECS #:NO5600000
Fraction by Wt: >99%
OSHA PEL:1 MG/M3 (FE)
ACGIH TLV:1 MG/M3 (FE); 8990

=====
Hazards Identification
=====

LD50 LC50 Mixture:NO INFORMATION GIVEN ON MSDS BY SUPPLIER
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:FERROUS CHLORIDE IS CORROSIVE TO BODY
TISSUES ESPECIALLY MUCOUS MEMBRANES. ACUTE TOXICITY IS FROM
CORROSIVITY AND IRON POISONING. CHRONIC OVEREXPOSURE MAY RESULT IN
HEMOSIDEROSIS AND LIVER DAMAGE.
Explanation of Carcinogenicity:NO INFORMATION GIVEN ON MSDS BY SUPPLIER
Effects of Overexposure:EYE: SEVERE IRRITATION, BURNS. SKIN:IRRITATION
TO BURNS IF CONTACT IS PROLONGED. INHALEDRESPIRATORY IRRITATION,
DIFFICULT BREATHING. INGESTED: SEVERE G/I IRRITATION (CORROSIVE),
ABDOMINAL PAIN, RETC HING, PROLONGED VOMITING, HEMATEMESIS,
DIARRHEA FOLLOWED BY TARRY STOOL.
Medical Cond Aggravated by Exposure:NO INFORMATION GIVEN ON MSDS BY
SUPPLIER

=====
First Aid Measures
=====

First Aid:EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN. SKIN:REMOVE

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CONTAMINATED CLOTHING AND LAUNDRER BEFORE REUSE. WASH WITH SOAP & WATER. INHALED:REMOVE TO FRESH AIR. RESTORE BREATHING AS NEEDED. INGESTED:IMMEDIATELY GIVE 2 LARGE GLASSES OF MILK OR WATER AND INDUCE VOMITING. (NOTHING BY MOUTH IF UNCONSCIOUS.) GET IMMEDIATE MEDICAL CARE. IF ANY IRRITATION PERSISTS OR IS SEVERE, SEE A DOCTOR.

===== Fire Fighting Measures =====

Flash Point:NONE
Extinguishing Media:DRY CHEMICAL, CO₂, WATER SPRAY, OR REGULAR FOAM.
Fire Fighting Procedures:MOVE FROM FIRE AREA IF YOU CAN DO IT W/O RISK.
APPLY COOLING WATER TO SIDES OF CONTAINER EXPOSED TO FLAMES UNTIL WELL AFTER FIRE IS OUT.
Unusual Fire/Explosion Hazard:STAY AWAY FROM ENDS OF TANKS. AVOID BREATHING CORROSIVE FUMES AND DUSTS FROM BURNING MATERIALS. KEEP UP WIND.

===== Accidental Release Measures =====

Spill Release Procedures:DO NOT TOUCH SPILLED MATL. STOP LEAK IF W/O RISK. SMALL SPILL: TAKE UP W/INERT ABSORBENT, OR SHOVEL SOLID OR ABSORBENT INTO CONTAINER FOR DISPOSAL. LG SPILL: DKIE FAR AHEAD OF SPILL FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE AWAY AND DENY ENTRY.
Neutralizing Agent:AGRICULTURAL LIME, SLAKED LIME, CRUSHED LIME STONE, OR SODIUM BICARBONATE

===== Handling and Storage =====

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE MATERIALS. STORE IN TIGHTLY CLOSED CONTAINERS.
Other Precautions:NO INFORMATION GIVEN ON MSDS BY SUPPLIER

===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH/MSHA APPROVED DUST/MIST RESPIRATOR W/FULL FACEPIECE, AIR SUPPLIED RESPIRATOR OR SCBA IF EXPOSURE IS ABOVE THE TLV/PEL. SEE 29 CFR 1910.134 FOR REGULATIONS PERTAINING TO RESPIRATOR USE.
Ventilation:PROVIDE LOCAL EXHAUST TO MEET PUBLISHED EXPOSURE LIMITS.
Protective Gloves:APPROPRIATE TO PREVENT CONTACT
Eye Protection:SPLASH/DUST RESIST GOGGLES + FACE SHIELD
Other Protective Equipment:EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT TO PREVENT ANY POSSIBILITY OF SKIN CONTACT.
Work Hygienic Practices:WHERE THERE IS POSSIBILITY OF EYE OR SKIN CONTACT EYE WASH FOUNTAIN AND QUICK DRENCH SHOWER SHOULD BE PROVIDED.
Supplemental Safety and Health
MSDS RECEIVED FROM NAVY (FOCAL POINT N). NAVY IDENTIFIED NSN.

===== Physical/Chemical Properties =====

HCC:T4
Melt/Freeze Pt:M.P/F.P Text:221F,105C
Decomp Temp:Decomp Text:-2 H₂O 221
Spec Gravity:POWDER
Solubility in Water:160.1%

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Appearance and Odor:PALE GREEN TO BLUE-GREEN CRYSTALS OR DELEQUESCENT
POWDER

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

ALKALI METALS, ETHYLENE OXIDE, OZONIDES, POTASSIUM, SODIUM

Stability Condition to Avoid:SUPPLIER DID NOT ADDRESS THIS FIELD.

Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS MAY
INCLUDE TOXIC AND CORROSIVE FUMES OF CHLORINE

===== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL
REGULATIONS. FOR ASSISTANCE CALL DISTRICT DIRECTOR OF EPA.

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FISHER SCIENTIFIC CO -- FERRIC NITRATE, NONAHYDRATE -- 6810-00-241-1153

=====
Product Identification
=====

Product ID:FERRIC NITRATE, NONAHYDRATE

MSDS Date:09/19/1986

FSC:6810

NIIN:00-241-1153

MSDS Number: BJYGB

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC CO

Address:52 FADEM RD

City:SPRINGFIELD

State:NJ

ZIP:07081-3116

Country:US

Info Phone Num:201-379-1400

Emergency Phone Num:201-379-1400

CAGE:94480

=== 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

Company Name:FISHER SCIENTIFIC COMPANY

Address:52 FADEM ROAD.DOMESTIC DIVISION

City:SPRINGFIELD

State:NJ

ZIP:07081

Country:US

Phone:201-796-7100

CAGE:94480

=====
Composition/Information on Ingredients
=====

Ingred Name:IRON (III) NITRATE, NONAHYDRATE (FERRIC NITRATE)

CAS:7782-61-8

RTECS #:NO7175000

Fraction by Wt: 100%

Other REC Limits:NONE SPECIFIED

ACGIH TLV:1 MG/M3

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL RAT) IS 3250 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 (TARRY), DEHYDRATION, SHOCK.

Explanation of Carcinogenicity:THIS MATERIAL IS NOT LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN.

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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. MAY CAUSE VASOMOTOR INSTABILITY FOLLOWED BY COMA.

Medical Cond Aggravated by Exposure:PERSONS WITH A HISTORY OF EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE. TARGET ORGANS INCLUDE THE LIVER, KIDNEYS, CNS, CARDIOVASCULAR, RESPIRATORY, AND DIGESTIVE SYSTEMS

===== 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: GIVE 2 TO 4 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT. GET MEDICAL HELP AT ONCE.

===== Fire Fighting Measures =====

Extinguishing Media:USE WATER FOG, CARBON DIOXIDE, OR DRY CHEMICAL AS APPROPRIATE FOR SURROUNDINGS.

Fire Fighting Procedures:WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.

Unusual Fire/Explosion Hazard:COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS.

===== 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. KEEP COMBUSTIBLE MATERIAL AWAY FROM SPILLED PRODUCT.

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:OXIDIZING AGENT - AVOID CONTACT WITH EASILY OXIDIZABLE SUBSTANCES.

===== 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:CHEMICAL 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

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CONTACT.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING AND BEFORE
EATING OR DRINKING. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Safety and Health
CORROSIVE MATERIAL AND OXIDIZING AGENT - AVOID CONTACT.

===== Physical/Chemical Properties =====

HCC:D1
Boiling Pt:B.P. Text:257F,125C
Melt/Freeze Pt:M.P/F.P Text:117F,47C
Spec Gravity:1.7
Solubility in Water:SOLUBLE
Appearance and Odor:PALE VIOLET TO GRAYISH-WHITE, SOMEWHAT
DELIQUESCENT, CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
REDUCING AGENTS. MIXTURES WITH OXOACIDS WITH THE SULPHOXIDE GROUP
(DMSO) ARE POWERFUL EXPLOSIVES.
Stability Condition to Avoid:CONTACT WITH EASILY OXIDIZABLE MATERIALS.
Hazardous Decomposition Products:TOXIC AND CORROSIVE FUMES OF NITROGEN
OXIDES

===== 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. UNDILUTED MATERIAL MAY BE A HAZARDOUS WASTE (D001)

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Material Safety Data Sheet

Lead (II) Chloride

ACC# 12570

Section 1 - Chemical Product and Company Identification

MSDS Name: Lead (II) Chloride

Catalog Numbers: S71958, S75099

Synonyms: Lead (2+) Chloride; Lead (II) Chloride; Lead 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
7758-95-4	Lead (II) chloride	99.0	231-845-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Warning! Causes eye and skin irritation. Causes digestive and respiratory tract irritation. May cause cancer based on animal studies. May cause liver and kidney damage. May cause central nervous system effects. This product contains lead, a chemical known to the state of California to cause developmental effects.

Target Organs: Kidneys, central nervous system, blood forming organs.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of lead compounds can cause toxic effects in the blood-forming organs, kidneys and central nervous system.

Inhalation: May cause respiratory tract irritation. May cause effects similar to those described for

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ingestion.

Chronic: Chronic exposure to lead may result in plumbism which is characterized by lead line in gum, headache, muscle weakness, mental changes.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of 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. 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.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep from contact with oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Lead (II) chloride	0.05 mg/m ³ TWA (as Pb) (listed under Lead, inorganic compounds).	0.050 mg/m ³ TWA (as Pb) (listed under Lead compounds).	50 æg/m ³ TWA (as Pb) (listed under Lead, inorganic compounds).50 æg/m ³ TWA (as Pb); 30 æg/m ³ Action Level (as Pb, Poison - see 29 CFR 1910.102 5) (listed under Lead, inorganic compounds).

OSHA Vacated PELs: Lead (II) 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 and clothing 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: 1 mm Hg @547 deg C

Vapor Density: Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: 950 deg C

Freezing/Melting Point: 497.8-501.1 deg C

Decomposition Temperature: Not available.

Solubility: 0.99%

Specific Gravity/Density: Not available.

Molecular Formula: PbCl₂

Molecular Weight: 278.106

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids.

Hazardous Decomposition Products: Hydrogen chloride, lead/lead oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7758-95-4: OF9450000

LD50/LC50:

CAS# 7758-95-4:

Oral, rat: LD50 = >1947 mg/kg;

Carcinogenicity:

CAS# 7758-95-4:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Lead, inorganic compounds').
- **California:** carcinogen, initial date 10/1/92 (listed as Lead compounds).
- **NTP:** Suspect carcinogen (listed as Lead compounds).
- **IARC:** Group 2A carcinogen (listed as Lead, inorganic compounds).

Epidemiology: There are several reports that certain lead compounds administered to animals in high doses are carcinogenic, primarily producing renal tumors. Salts demonstrating carcinogenicity in animals are usually soluble salts. Epidemiological studies have not shown a relationship between lead exposure and the incidence of cancer in lead workers. However, one study of lead-exposed workers demonstrated a statistically significant elevation in the standardized mortality ratio for gastric and lung cancer in battery plant workers only.

Teratogenicity: Lead penetrates the placental barrier and has caused fetal abnormalities in animals. Excessive exposure to lead during pregnancy has caused neurological disorders in infants.

Reproductive Effects: Reproductive effects from lead have been documented in animals and human

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beings of both sexes. In battery workmen with a mean exposure of 8.5 years to lead, there was an increased frequency of sperm abnormalities as compared with a control group.

Mutagenicity: No information found

Neurotoxicity: Subtle neurologic effects have been demonstrated with relatively low blood levels of lead. The performance of lead workers on various neurophysiological tests was mildly reduced when compared with a control group. Anxiety, depression, poor concentration, forgetfulness, mild reductions in motor and sensory nerve conduction velocities have been documented in lead-exposed workers.

Other Studies:

Section 12 - Ecological Information

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:	LEAD COMPOUNDS, SOLUBLE, N.O.S.	No information available.
Hazard Class:	6.1	
UN Number:	UN2291	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-95-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7758-95-4: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7758-95-4: immediate, delayed.

Section 313

This material contains Lead (II) chloride (listed as Lead, inorganic compounds), 99.0%, (CAS# 7758-95-4) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7758-95-4 (listed as Lead compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7758-95-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7758-95-4 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# 7758-95-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Lead, inorganic compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Lead (II) chloride, listed as 'Lead compounds', a chemical known to the state of California to cause cancer. WARNING: This product contains Lead (II) chloride, listed as 'Lead, inorganic compounds', a chemical known to the state of California to cause developmental reproductive toxicity.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 33 Danger of cumulative effects.

R 61 May cause harm to the unborn child.

R 62 Possible risk of impaired fertility.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous

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s waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7758-95-4: No information available.

Canada - DSL/NDSL

CAS# 7758-95-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7758-95-4 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 12/17/1998

Revision #8 Date: 11/06/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Lead metal foil

ACC# 91794

Section 1 - Chemical Product and Company Identification

MSDS Name: Lead metal foil

Catalog Numbers: S75143

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
7439-92-1	Lead	100	231-100-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: bluish white, silvery gray foil.

Caution! Causes eye and skin irritation. May be absorbed through intact skin. May cause respiratory and digestive tract irritation. May cause central nervous system depression. May cause kidney damage. May cause adverse reproductive effects. Dangerous for the environment. May cause fetal effects.

Target Organs: Kidneys, central nervous system, blood forming organs.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be absorbed through the skin.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of lead compounds can cause toxic effects in the blood-forming organs, kidneys and central nervous system. Symptoms of lead poisoning or plumbism include weakness, weight loss, lassitude, insomnia, and hypotension. It also includes constipation, anorexia, abdominal discomfort and colic.

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Inhalation: May cause respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause effects similar to those described for ingestion.

Chronic: Chronic exposure may cause reproductive disorders and teratogenic effects. 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.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Dimercaprol or BAL (British Anti-Lewisite) as a chelating agent should be determined by qualified medical personnel. The use of d-Penicillamine as a chelating agent should be determined by qualified medical personnel. The use of Calcium disodium EDTA as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills

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immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage: Store in a cool, dry place. Keep from contact with oxidizing materials. 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
Lead	0.05 mg/m ³ TWA	0.050 mg/m ³ TWA 100 mg/m ³ IDLH	50 æg/m ³ TWA; 50 æg/m ³ TWA (as Pb); 30 æg/m ³ Action Level (as Pb. Poison - see 29 CFR 1910.10 25)

OSHA Vacated PELs: Lead: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: Foil

Appearance: bluish white, silvery gray

Odor: none reported

pH: Not applicable.

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Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: Not available.
Molecular Formula: Pb
Molecular Weight: 207.2

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Excess heat, strong oxidants.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Lead/lead oxides.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7439-92-1: OF7525000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7439-92-1:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** carcinogen, initial date 10/1/92
- **NTP:** Suspect carcinogen
- **IARC:** Group 2A carcinogen

Epidemiology: There are several reports that certain lead compounds administered to animals in high doses are carcinogenic, primarily producing renal tumors. Salts demonstrating carcinogenicity in animals are usually soluble salts. Epidemiological studies have not shown a relationship between lead exposure and the incidence of cancer in lead workers. However, one study of lead-exposed workers demonstrated a statistically significant elevation in the standardized mortality ratio for gastric and lung cancer in battery plant workers only.

Teratogenicity: Lead penetrates the placental barrier and has caused fetal abnormalities in animals. Excessive exposure to lead during pregnancy has caused neurological disorders in infants.

Reproductive Effects: Reproductive effects from lead have been documented in animals and human beings of both sexes. In battery workmen with a mean exposure of 8.5 years to lead, there was an

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increased frequency of sperm abnormalities as compared with a control group.

Mutagenicity: No data available.

Neurotoxicity: Subtle neurologic effects have been demonstrated with relatively low blood levels of lead. The performance of lead workers on various neurophysiological tests was mildly reduced when compared with a control group. Anxiety, depression, poor concentration, forgetfulness, mild reductions in motor and sensory nerve conduction velocities have been documented in lead-exposed workers.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. LC50 Japanese quail (*Coturnix japonica*), males or females, 14 days old, oral (5-day ad libitum in diet) >5,000 ppm; at 1000, 2236 & 5000 onset of toxic signs began at 7, 7 & 7 days and remitted at 11, 11 & 12 days, respectively, no mortality was observed; control references were dieldrin & dicrotophos; corn oil diluent was added to diet at ratio of 2:98 by wt; (extreme concentrations: 1,000-5,000 ppm) /Lead metal, 100%.

Environmental: Terrestrial: Extremely stable metal. While some corrosion may be expected in soil, generally an inert coat of an insoluble salt will form and limit further corrosion. Aquatic: Lead will simply sink into the sediment. Atmospheric: Will be in particulate matter and be subject to washout and gravitational settling. Will biodegrade and bioconcentrate.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7439-92-1 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

CAS# 7439-92-1: 10 lb final RQ (no reporting of releases of this hazardous substance is required)

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7439-92-1: immediate, delayed.

Section 313

This material contains Lead (CAS# 7439-92-1, 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. CAS# 7439-92-1 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7439-92-1 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7439-92-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Lead, a chemical known to the state of California to cause cancer.

WARNING: This product contains Lead, a chemical known to the state of California to cause male reproductive toxicity.

California No Significant Risk Level: CAS# 7439-92-1: 15 æg/day NSRL (oral)

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

Material Safety Data Sheets, Carver Hall RM 208-A

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:

WGK (Water Danger/Protection)

CAS# 7439-92-1: No information available.

Canada - DSL/NDSL

CAS# 7439-92-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7439-92-1 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 4/17/2001

Revision #4 Date: 3/16/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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GARDINER METAL CO -- LEAD-FLASHINGS,SHEET,PLGS,INGOTS,PIPE, 25 -- 9650-00N045687

=====
Product Identification
=====

Product ID:LEAD-FLASHINGS, SHEET, PLGS, INGOTS, PIPE, 25
MSDS Date:08/01/1992
FSC:9650
NIIN:00N045687
MSDS Number: BTPWM
=== Responsible Party ===
Company Name:GARDINER METAL CO
Address:4820 SOUTH CAMPBELL AVE
City:CHICAGO
State:IL
ZIP:60632
Country:US
Info Phone Num:312-847-0100
Emergency Phone Num:312-847-0100;800-424-9300 (CHEMTREC)
CAGE:73766

==== Contractor Identification ====

Company Name:GARDINER METAL CO
Address:4820 SOUTH CAMPBELL AVENUE
City:CHICAGO
State:IL
ZIP:60632
Country:US
Phone:312-847-0100, 800-424-9300
CAGE:73766
Company Name:GARDINER SOLDER COMPANY DIV GARDINER METAL CO
Address:4820 S CAMPBELL AVE
Box:City:CHICAGO
State:IL
ZIP:60632-1494
Country:US
Phone:312-847-0100 CHEMTREC AFTER HOURS
CAGE:84311

=====
Composition/Information on Ingredients
=====

Ingred Name:LEAD
CAS:7439-92-1
RTECS #:OF7525000
Fraction by Wt: 100%
OSHA PEL:0.05 MG/M3
ACGIH TLV:0.15 MG/M3 DUST
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE/CHRONIC: HEALTH STUDIES HAVE
SHOWN THAT POTENTIAL HEALTH RISKS MAY VARY BY INDIVIDUAL. ALWAYS
MINIMIZE EXPOSURE AS A PRECAUTION. SIGNS/SYMP: METALLIC TASTE IN
MOUTH. IRRITATION OF RESPIRATORY T RACT. LEAD APPEARS ON NAVY
LISTING OF OCCUPATIONAL CHEMICAL REPRODUCTIVE HAZARDS. SEEK
CONSULTATION (EFTS OF OVEREXP)

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Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HLTH HAZ: FROM APPROPRIATE HEALTH PROFESSIONALS CONCERNING LATEST HAZ LIST INFORMATION AND SAFE HANDLING AND EXPOSURE INFORMATION .

Medical Cond Aggravated by Exposure:RESPIRATORY/LUNG CONDITIONS.

===== First Aid Measures =====

First Aid:SKIN: FLUSH WITH WATER IMMED-TREAT FOR BURNS, SEEK MED ATTN IF REQD. EYES: FLUSH W/WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION. INGEST: DRINK LARGE AMOUNTS OF WATER. SEEK MEDICAL ATTENTION. NEVER GIVE LIQUIDS TO AN UNCON PERSON. INHAL: REMOVE TO FRESH AIR. SUPPORT REPSIRATION IF REQUIRED-SEEK MEDICAL ATTENTION.

===== Fire Fighting Measures =====

Flash Point:NON FLAMMABLE

Extinguishing Media:DRY CHEMICAL, DO NOT USE WATER.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:NONE.

===== Accidental Release Measures =====

Spill Release Procedures:COLLECT AND USE, IF CONTAMINATED OR IN SMALL PARTICLES VACUUM, OR COLLECT MATERIAL. NEVER USE ANY METHOD WHICH WILL GENERATE DUST.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:AVOID FUMES AND DUST.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:0.03 MG/M3-NIOSH/MSHA APPROVED HALF MASK; 2.5 MG/ M3-NIOSH/MSHA APPRVD FULL FACE MASK (DURING SOLDERING). 50 MG/M3-NIOSH/MSHA APPROVED SELF-SUSTAINED RESP SUIT.

Ventilation:LOCAL EXHAUST PREFERRED. SPECIAL: HEPA FILTERS REQUIRED. MECHANICAL: OK.

Protective Gloves:HEAT RESISTANT.

Eye Protection:GOGGLES OR FACE SHIELD DURING SOLDERING.

Other Protective Equipment:AS REQUIRED TO AVOID CONTACT.

Work Hygienic Practices:WASH AFTER USE. FOLLOW GOOD INDUSTRIAL HYGIENIC PRACTICES.

Supplemental Safety and Health

NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:N1

Boiling Pt:B.P. Text:3164F,1740C

Melt/Freeze Pt:M.P/F.P Text:621F,327C

Vapor Pres:1.7@1028C

Solubility in Water:INSOLUBLE

Appearance and Odor:SILVER GREY SOLID, ODORLESS

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===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES

OXIDIZING MATERIALS.

Stability Condition to Avoid: NONE.

Hazardous Decomposition Products: TOXIC METAL FUMES ABOVE 1000C (1832F).

===== Disposal Considerations =====

Waste Disposal Methods: NEVER DISPOSE OF IN TRASH. HOLD FOR RECYCLING OR
DISPOSE OF I/A/W ALL LOCAL, STATE AND FEDERAL REGULATIONS.

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document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Lead(II) nitrate

ACC# 12660

Section 1 - Chemical Product and Company Identification

MSDS Name: Lead(II) nitrate

Catalog Numbers: AC193320000, AC193320100, AC211560000, AC211560010, AC211560050, AC211565000, AC423850000, AC423850050, AC423855000, S71959, S73056, S75326, S75329, S93274, L61-3, L62-100, L62-500

Synonyms: Lead dinitrate; Nitric acid, lead(2+) salt; Plumbous nitrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10099-74-8	Lead nitrate	>99	233-245-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause harm to the unborn child. Harmful if inhaled or swallowed. Impairs the oxygen carrying capacity of the blood. Possible risk of impaired fertility. May cause cancer based on animal studies. May cause kidney damage. May cause central nervous system effects. Danger of cumulative effects. Marine pollutant.

Target Organs: Blood, kidneys, central nervous system, reproductive system.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Harmful if swallowed. Ingestion of nitrate containing compounds can lead to

Material Safety Data Sheets, Carver Hall RM 208-A

methemoglobinemia. Ingestion of lead compounds can cause toxic effects in the blood-forming organs, kidneys and central nervous system. Ingestion of lead compounds can produce symptoms of lead poisoning. Symptoms of lead poisoning or plumbism include weakness, weight loss, lassitude, insomnia, and hypotension. It also includes constipation, anorexia, abdominal discomfort and colic.

Inhalation: Harmful if inhaled. 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. 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. Chronic exposure to lead may result in plumbism which is characterized by lead line in gum, headache, muscle weakness, mental changes. Lead salts have been reported to cross the placenta and induce embryo- and feto- mortality. Chronic exposure to lead may cause adverse effects on human reproduction, embryonic and fetal development and postnatal (e.g., mental) development.

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. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use water only!

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; Special Hazard: OX

Section 6 - Accidental Release Measures

Material Safety Data Sheets, Carver Hall RM 208-A

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep from contact with clothing and other combustible materials. Do not breathe dust. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Keep away from reducing agents.

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
Lead nitrate	0.05 mg/m ³ TWA (as Pb) (listed under Lead, inorganic compounds).	0.050 mg/m ³ TWA (as Pb) (listed under Lead compounds).	50 æg/m ³ TWA (as Pb); 30 æg/m ³ Action Level (as Pb). Poison - see 29 CFR 1910.1025 (listed under Lead, inorganic compounds).

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 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. Refer to 29 CFR 1910.1025 for regulations on respiratory protection required during exposure to lead and lead compounds.

Section 9 - Physical and Chemical Properties

Material Safety Data Sheets, Carver Hall RM 208-A

Physical State: Solid
Appearance: white
Odor: odorless
pH: 3-4 (20% aq soln)
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 470 deg C
Decomposition Temperature: 470 deg C
Solubility: Soluble.
Specific Gravity/Density: 4.53
Molecular Formula: N₂O₆Pb
Molecular Weight: 331.20

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 reducing agents, combustible organics.
Hazardous Decomposition Products: Nitrogen oxides, lead/lead oxides, lead fumes.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 10099-74-8: OG2100000

LD50/LC50:

Not available.

Oral LDLo guinea pig: 500 mg/kg.

Carcinogenicity:

CAS# 10099-74-8:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Lead, inorganic compounds').
- **California:** carcinogen, initial date 10/1/92 (listed as Lead compounds).
- **NTP:** Suspect carcinogen (listed as Lead compounds).
- **IARC:** Group 2A carcinogen (listed as Lead, inorganic compounds).

Epidemiology: Repeated exposure to lead has caused many toxic effects including: neurological changes, kidney damage, and blood abnormalities.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

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Neurotoxicity: Repeated exposure to lead has caused neurological changes.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Marine pollutant.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	LEAD NITRATE	LEAD NITRATE
Hazard Class:	5.1	5.1(6.1)
UN Number:	UN1469	UN1469
Packing Group:	II	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

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None of the chemicals are listed under TSCA Section 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# 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: immediate, delayed, fire, reactive.

Section 313

This material contains Lead nitrate (listed as Lead, inorganic compounds), >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:

CAS# 10099-74-8 (listed as Lead compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 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. CAS# 10099-74-8 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# 10099-74-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Lead, inorganic compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Lead nitrate, listed as 'Lead compounds', a chemical known to the state of California to cause cancer. WARNING: This product contains Lead nitrate, listed as 'Lead, inorganic compounds', a chemical known to the state of California to cause developmental reproductive toxicity. California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T O N

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 33 Danger of cumulative effects.

R 8 Contact with combustible material may cause fire.

R 61 May cause harm to the unborn child.

R 62 Possible risk of impaired fertility.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 17 Keep away from combustible material.

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.

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S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

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 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# 10099-74-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997

Revision #8 Date: 6/22/2006

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheets, Carver Hall RM 208-A

ALDRICH -- LEAD SHOT 1 TO 3MM 99.9995%, 26593-4 -- 6810-00N046878

=====
Product Identification
=====

Product ID:LEAD SHOT 1 TO 3MM 99.9995%, 26593-4
MSDS Date:01/08/1993
FSC:6810
NIIN:00N046878
MSDS Number: BSJYY
=== Responsible Party ===
Company Name:ALDRICH
Address:1001 WEST SAINT PAUL AVE
City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Info Phone Num:800-325-5832; 314-771-5765
Emergency Phone Num:800-231-8327; 414-273-3850
CAGE:IO673

==== Contractor Identification ====

Company Name:ALDRICH
Address:1001 WEST SAINT PAUL AVE
Box:City:MILWAUKEE
State:WI
ZIP:53233
Country:US
Phone:800-325-5832;314-771-5765
CAGE:IO673
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:LEAD; (LEAD, SHOT, 1 TO 3MM) (SARA III)
CAS:7439-92-1
RTECS #:OF7525000
Fraction by Wt: 99.995%
OSHA PEL:0.05 MG/M3
ACGIH TLV:0.15 MG/M3
EPA Rpt Qty:1 LB
DOT Rpt Qty:1 LB

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:HARMFUL IF INHALED/SWALLOWED.
MAY CAUSE IRRITATION, CNS DISTURBANCES. CHRONIC:LEAD APPEARS ON THE
NAVY LISTING OF OCCUPATIONAL CHEMICAL REPRODUCTIVE HAZARDS. SEEK
CONSULTATION FROM APPROPRIATE HEALTH PROFESSIONALS CONCERNING
LATEST HAZARD LIST INFORMATION & SAFE HANDLING & EXPOSURE

Material Safety Data Sheets, Carver Hall RM 208-A

INFORMATION (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HLTH HAZ:ANEMIA. TARGET ORGANS:NERVES, BLOOD, KIDNEYS, FEMALE & MALE REPRODUCTIVE SYSTEM.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:INGEST: CALL MD IMMEDIATELY . INHAL: REMOVE TO FRESH AIR.

EYES: IMMED FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN: FLUSH WITH WATER.

===== Fire Fighting Measures =====

Extinguishing Media:USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

===== Accidental Release Measures =====

Spill Release Procedures:CHEMICAL SAFETY GOGGLES. USE PROTECTIVE CLOTHING, GLOVES & MASK. SWEEP UP, PLACE IN A BAG & HOLD FOR WASTE DISPOSAL.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:HARMFUL SOLID. KEEP CONTAINER TIGHTLY CLOSED. AVOID CONTACT & INHALATION; DO NOT BREATHE DUST. AVOID PRLNG/RPTD EXPOSURE.

Other Precautions:VIOLENT REACTION OF LEAD W/AMMONIUM NITRATE, HYDROGEN PEROXIDE, SODIUM AZIDE, ZIRCONIUM, SODIUM ACETYLIDE & CHLORINE TRIFLUORIDE HAVE BEEN REPORTED. REPRO HAZ. IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE (SHOW THE LABEL WHERE POSSIBLE).

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR IN NONVENTILATED AREAS AND/OR FOR EXPOSURE ABOVE THE ACGIH TLV.

Ventilation:MECHANICAL EXHAUST REQUIRED.

Protective Gloves:COMPATIBLE CHEMICAL-RESISTANT GLOVES.

Eye Protection:CHEMICAL SAFETY GOGGLES.

Other Protective Equipment:SAFETY SHOWER & EYE BATH. WEAR SUITABLE PROTECTIVE CLOTHING.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:N1

Melt/Freeze Pt:M.P/F.P Text:621F,327C

Appearance and Odor:GREY METAL SHOT.

===== Stability and Reactivity Data =====

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Stability Indicator/Materials to Avoid: YES

STRONG ACIDS.

Stability Condition to Avoid: NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products: NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.

=====
===== Disposal Considerations =====

Waste Disposal Methods: MATERIAL IN THE ELEMENTAL STATE SHOULD BE RECOVERED FOR REUSE OR RECYCLING. OBSERVE ALL FEDERAL, STATE & LOCAL ENVIRONMENTAL REGULATIONS.

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Material Safety Data Sheets, Carver Hall RM 208-A

E M SCIENCE, A DIVISION OF EM INDUSTRIES -- LEAD TETRAOXIDE -- 6810-00-241-1120

=====
Product Identification
=====

Product ID:LEAD TETRAOXIDE

MSDS Date:07/23/1993

FSC:6810

NIIN:00-241-1120

MSDS Number: BWMP5

=== Responsible Party ===

Company Name:E M SCIENCE, A DIVISION OF EM INDUSTRIES

Address:480 DEMOCRAT RD

Box:70

City:GIBBSTOWN

State:NJ

ZIP:08027

Country:US

Info Phone Num:609-354-9200

Emergency Phone Num:609-354-9200/800-424-9300 (CHEMTREC)

CAGE:EO379

=== Contractor Identification ===

Company Name:CHEMICAL COMMODITIES AGENCY, INC.

Address:27447 PACIFIC STREET

Box:City:HIGHLAND

State:CA

ZIP:92346-2640

Country:US

Phone:909-864-2310

CAGE:60777

Company Name:E M SCIENCE

Address:480 DEMOCRATE RD

Box:70

City:GIBBSTOWN

State:NJ

ZIP:08027

Country:US

Phone:609-354-9200/800-424-9300 (CHEMTREC)

CAGE:0SK29

Company Name:E M SCIENCE, A DIV OF E M INDUSTRIES INC.

Address:111 WOODCREST RD

Box:70

City:CHERRY HILL

State:NJ

ZIP:08034-0395

Country:US

Phone:609-354-9200 FAX: 609-423-4389

CAGE:EO379

=====
Composition/Information on Ingredients
=====

Ingred Name:LEAD OXIDE, (RED LEAD OXIDE)

CAS:1314-41-6

RTECS #:OG5425000

Fraction by Wt: 100%

Other REC Limits:NONE RECOMMENDED

OSHA PEL:SEE 1910.1025

ACGIH TLV:0.15 MG/M3

=====
Hazards Identification
=====

Material Safety Data Sheets, Carver Hall RM 208-A

LD50 LC50 Mixture:LD50 (IPR, RAT) IS 650 MG/KG.

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO

Reports of Carcinogenicity:NTP:NO IARC:YES OSHA:NO

Health Hazards Acute and Chronic:TARGET ORGANS:EYES, BLOOD, NERVOUS AND DIGESTIVE SYSTEMS. ACUTE AND CHRONIC- CUMULATIVE POISON! HARMFUL IF INHALED OR SWALLOWED. MAY CAUSE DAMAGE TO BLOOD, NERVOUS AND DIGESTIVE SYSTEMS. OVEREXPOSURE MAY CAUSE ABDOMINAL PAINS, COLIC, ANEMIA, WEIGHT LOSS, INSOMNIA, EYE PROBLEMS, CONSTIPATION.

Explanation of Carcinogenicity:MAY BE CARCINOGENIC TO HUMAN.

Effects of Overexposure:METALLIC TASTE, ABDOMINAL PAIN, CONSTIPATION, FATIGUE, SLEEPLESS, COLIC, WEIGHT LOSS

===== First Aid Measures =====

First Aid:GET MEDICAL HELP IN ALL CASES. INHALED:REMOVE TO FRESH AIR. PROVIDE CPR/OXYGEN IF NEEDED. EYES:FLUSH WITH WATER FOR 15 MINUTES. HOLD EYELIDS OPEN. SKIN:WASH WITH SOAP AND WATER. ORAL:IF CONSCIOUS, DRINK WATER AND IMMEDIATELY INDUCE VOMITING AS DIRECTED BY MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

===== Fire Fighting Measures =====

Flash Point:NONE

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, ALCOHOL FOAM, WATER

Fire Fighting Procedures:WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS.

Unusual Fire/Explosion Hazard:COMBUSTIBLE BY CHEMICAL REACTION WITH REDUCING AGENTS. EXPLODES ON CONTACT WITH PEROXYFORMIC ACID.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR PROTECTIVE EQUIPMENT. VENTILATE AREA. REMOVE IGNITION SOURCES. CONTAIN SPILL. WITH CLEAN DRY SHOVEL, PLACE MATERIAL INTO A CLEAN DRY CONTAINER AND COVER. MOVE CONTAINERS FROM SPILL AREA. AVOID GENERATING DUST.

Neutralizing Agent:NOT RELEVANT

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY, WELL VENTILATED AREA AWAY FROM INCOMPATIBLE MATERIALS.

Other Precautions:WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR SMOKING. DO NOT GENERATE DUST. DO NOT BREATHE DUST. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. KEEP OUT OF REACH OF CHILDREN.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS OPERATED IN POSITIVE PRESSURE MODE OR SUPPLIED-AIR RESPIRATOR IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT IS EXCEEDED.

Ventilation:USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

Protective Gloves:NEOPRENE

Eye Protection:DUST-RESISTANT GOGGLES

Other Protective Equipment:EYE WASH STATION, QUICK DRENCH SHOWER AND IMPERVIOUS CLOTHING

Material Safety Data Sheets, Carver Hall RM 208-A

Work Hygienic Practices:OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT TAKE INTERNALLY.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:N1

NRC/State Lic Num:NOT RELEVANT

Boiling Pt:B.P. Text:2682F,1472C

Melt/Freeze Pt:M.P/F.P Text:1634F,890C

Spec Gravity:9.1

Viscosity:NOT RELEVANT

Evaporation Rate & Reference:NOT RELEVANT

Solubility in Water:INSOLUBLE

Appearance and Odor:RED, HEAVY POWDER

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

HEAT IN THE PRESENCE OF ALUMINUM, SODIUM, TITANIUM, ZINC; REDUCING AGENTS, HYDROGEN PEROXIDE

Stability Condition to Avoid:TEMPERATURES ABOVE 930F.

Hazardous Decomposition Products:LEAD

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. EPA WASTE NUMBERS: D001, D008. CONTACT YOUR LOCAL PERMITTED WASTE DISPOSAL SITE (TSD) FOR PERMISSIBLE TREATMENT SITES.

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Material Safety Data Sheets, Carver Hall RM 208-A

CAROLINA BIOGOLICAL SUPPLY CO -- LEAD NITRATE, 87-2130, 125 G. -- 6810-00D007011

=====
Product Identification
=====

Product ID:LEAD NITRATE, 87-2130, 125 G.
MSDS Date:07/22/1997
FSC:6810
NIIN:00D007011
MSDS Number: CFKCG
=== Responsible Party ===
Company Name:CAROLINA BIOGOLICAL SUPPLY CO
Address:2700 YORK RD
City:BURLINGTON
State:NC
ZIP:27215-3387
Country:US
Info Phone Num:800-227-1150/910-584-0381 (OUT SIDE)
Emergency Phone Num:800-227-1150/910-584-0381 (OUT SIDE)
CAGE:59896

==== Contractor Identification ====

Company Name:CAROLINA BIOLOGICAL SUPPLY CO
Address:2700 YORK RD
Box:City:BURLINGTON
State:NC
ZIP:27215-3387
Country:US
Phone:800-227-1150/910-584-0381
CAGE:59896

=====
Composition/Information on Ingredients
=====

Ingred Name:LEAD NITRATE (SARA 313)
CAS:10099-74-8
RTECS #:OG2100000
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:SEE 1910.1025
ACGIH TLV:0.15 MG(PB)/M3; 9596
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL RAT) IS 93 MG/KG (RTECS).
Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:YES OSHA:NO
Health Hazards Acute and Chronic:TARGET ORGANS:EYE, SKIN, KIDNEY,
RESPIRATORY & GI TRACTS. ACUTE- POISON. EYE/SKIN:MAY CAUSE
IRRITATION. INHALE/INGESTION:MAY CAUSE WEAKNESS, FATIGUE, SLEEP
DISTURBANCES, HEADACHE, ACHING BONES & MUSCL ES, ABDOMINAL PAIN,
CONSTIPATION & DECREASED APPETITE. CHRONIC- ANEMIA, PALLOR,
CONVULSIONS, COMA, KIDNEY INJURY, DEATH.
Explanation of Carcinogenicity:LEAD NITRATE.
Effects of Overexposure:IRRITATION, WEAKNESS, FATIGUE, SLEEP
DISTURBANCES, HEADACHE, ACHING BONES & MUSCLES, ABDOMINAL PAIN,
CONSTIPATION, DECREASED APPETITE, ANEMIA, PALLOR, CONVULSIONS,
COMA, KIDNEY INJURY, POSSIBLY DEATH

=====
First Aid Measures
=====

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First Aid:CALL A DOCTOR IF SYMPTOMS PERSIST. EYE:FLUSH WITH WATER FOR 15 MINUTES. HOLD EYELIDS OPEN. SEE PHYSICIAN. SKIN:FLUSH WITH WATER, THEN WASH WITH SOAP & WATER. INHALED:REMOVE TO FRESH AIR. PROVIDE CPR/O XYGEN IF NEEDED. ORAL:IF CONSCIOUS, DRINK WATER & INDUCE VOMITING. CALL A PHYSICIAN/POISON CONTROL CENTER IMMEDIATELY. NEVER GIVE FLUID OR INDUCE VOMITING IF PATIENT IS UNCONSCIOUS OR HAS CONVULSIONS.

===== Fire Fighting Measures =====

Flash Point:NONE

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. FORMS TOXIC FUMES.

Unusual Fire/Explosion Hazard:OXIDIZER. INCREASES THE FLAMMABILITY OF ANY COMBUSTIBLE SUBSTANCES.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR SUITABLE PROTECTIVE CLOTHING. AVOID MAKING DUST. SWEEP UP AND PLACE IN A SUITABLE CONTAINER FOR LATER DISPOSAL. WASH SPILL SITE WELL WITH SOAP AND WATER AFTER PICK UP IS COMPLETE.

Neutralizing Agent:NOT RELEVANT

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A COOL, DRY, VENTILATED PLACE AWAY FROM COMBUSTIBLE MATERIALS AND FIRE HAZARDS. KEEP CONTAINER TIGHTLY CLOSED.

Other Precautions:POISON AND OXIDIZER. AVOID CREATING DUST. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. AVOID INHALATION OF DUST OR FUME. KEEP OUT OF REACH OF CHILDREN. OBEY HAZARD WARNING LABEL. FOR LABORATORY USE ONL Y. NOT FOR DRUG, FOOD OR HOUSEHOLD USE.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE SHOULD BE NEEDED IN NORMAL LABORATORY HANDLING. IF DUSTY CONDITIONS PREVAIL, WORK IN A FUME HOOD OR WEAR A NIOSH-APPROVED DUST RESPIRATOR OR DUST MASK. IN EMERGENCY, WEAR NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS.

Ventilation:USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

Protective Gloves:RUBBER, LATEX

Eye Protection:SAFETY GOGGLES/CHEMICAL SAFETY GLASSES

Other Protective Equipment:EYE WASH STATION, SAFETY SHOWER, PROTECTIVE CLOTHING AND/OR UNIFORM

Work Hygienic Practices:OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:D2

NRC/State Lic Num:NOT RELEVANT

Material Safety Data Sheets, Carver Hall RM 208-A

Boiling Pt:B.P. Text:DECOMPOSES
Melt/Freeze Pt:M.P/F.P Text:DECOMPOSE
Decomp Temp:Decomp Text:878F,470C
Vapor Pres:NEGLIGIBLE
Vapor Density:11.0
Spec Gravity:4.53
Evaporation Rate & Reference:NOT RELEVANT
Solubility in Water:APPRECIABLE (>10%)
Appearance and Odor:WHITE OR COLORLESS TRANSLUCENT CRYSTALS - ODORLESS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
ORGANIC MATERIALS, REDUCING AGENTS
Stability Condition to Avoid:EXCESSIVE HEAT
Hazardous Decomposition Products:MAY FORM OXIDES OF NITROGEN, LEAD
FUME.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE
AND FEDERAL REGULATIONS. MAY BE DISPOSED OF IN AN APPROVED CHEMICAL
LANDFILL OR CONTRACT WITH A LICENSED WASTE DISPOSAL SERVICE.

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Material Safety Data Sheets, Carver Hall RM 208-A

EM SCIENCE -- LIMESTONE MARBLE, 2069 -- 6810-00N046944

=====
===== Product Identification =====

Product ID:LIMESTONE MARBLE, 2069
MSDS Date:03/01/1991
FSC:6810
NIIN:00N046944
MSDS Number: BVHRG
=== Responsible Party ===
Company Name:EM SCIENCE
Address:480 DEMOCRAT RD
Box:70
City:GIBBSTOWN
State:NJ
ZIP:08027
Country:US
Info Phone Num:609-354-9200
Emergency Phone Num:609-354-9200;800424-9300 (CHEMTREC)
CAGE:DO242

==== Contractor Identification ===
Company Name:E M SCIENCE DIV OF E M INDUSTRIES INC
Address:480 DEMOCRAT ROAD
Box:70
City:GIBBSTOWN
State:NJ
ZIP:08027
Country:US
Phone:800-222-0342/609-423-6300
CAGE:63612
Company Name:EM SCIENCE
Address:480 DEMOCRAT RD
City:GIBBSTOWN
State:NJ
ZIP:08927
Phone:800-424-9300 (CHEMTREC)
CAGE:DO242

=====
===== Composition/Information on Ingredients =====

Ingred Name:NO INGREDIENT FOR THIS FORMULATION_INGREDIENT

=====
===== Fire Fighting Measures =====

Flash Point:NONCOMBUSTIBLE
Extinguishing Media:USE ANY SUITABLE FOR ADJACENT MATERIAL.
Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT .
Unusual Fire/Explosion Hazard:IGNITES ON CONTACT WITH F2.

=====
===== Exposure Controls/Personal Protection =====

Supplemental Safety and Health

=====
===== Physical/Chemical Properties =====

HCC:N1
Melt/Freeze Pt:M.P/F.P Text:1517F,825C
Spec Gravity:SUPDAT

Material Safety Data Sheets, Carver Hall RM 208-A

Solubility in Water:0.01%

Appearance and Odor:WHITE POWDER OR CHIPS; ODORLESS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

ACIDS, FLUORINE, MAGNESIUM PLUS HYDROGEN.

Stability Condition to Avoid:NONE.

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SIGMA CHEMICAL CO -- LITHIUM SULFATE, L6375 -- 6810-00N021654

=====
Product Identification
=====

Product ID:LITHIUM SULFATE, L6375

MSDS Date:12/19/1988

FSC:6810

NIIN:00N021654

MSDS Number: BLNTQ

=== Responsible Party ===

Company Name:SIGMA CHEMICAL CO

Box:14508

City:ST LOUIS

State:MO

ZIP:63178

Country:US

Info Phone Num:314-771-5765

Emergency Phone Num:800-325-8070

CAGE:21076

==== Contractor Identification ===

Company Name:SIGMA CHEMICAL COMPANY

Address:3050 SPRUCE ST

Box:14508

City:ST LOUIS

State:MO

ZIP:63178

Country:US

Phone:314-771-5765

CAGE:21076

=====
Composition/Information on Ingredients
=====

Ingred Name:LITHIUM SULFATE (2:1); (LITHIUM SULPHATE)

CAS:10377-48-7

RTECS #:OJ6419000

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 1190 MG/KG

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:HARMFUL IF SWALLOWED, INHALED, OR
ABSORBED THROUGH SKIN. LITHIUM ION HAS CNS TOXICITY. LARGE DOSES OF
LITHIUM COMPOUNDS HAVE CAUSED DIZZINESS AND PROSTRATION. CAN CAUSE
KIDNEY DAMAGE, ANOREXIA, NAUSEA , APATHY, COMA AND DEATH.

Explanation of Carcinogenicity:NOT RELEVANT.

Effects of Overexposure:SEE HEALTH HAZARDS

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:INGEST: WASH OUT MOUTH W/H2O PROVIDED PERSON IS CONSCIOUS.

CALL MD. SKIN: FLUSH W/COPIOUS AMNTS OF H2O FOR AT LEAST 15 MIN.

REMOVE CONTAM CLTHG & SHOES & CALL A PHYSICIAN. INHAL: REMOVE

PERSON TO FRES H AIR. IF BREATHING BECOMES DIFFICULT, CALL A

PHYSICIAN. EYES: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST

15 MIN. ASSURE ADEQUATE FLUSHING BY SEPARATING LIDS W/FINGERS. CALL

A PHYSICIAN.

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===== Fire Fighting Measures =====

Extinguishing Media:EXTINGUISHING MEDIA SUITABLE FOR SURROUNDING FIRE .
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:NONE SPECIFIED BY MANUFACTURER.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR 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:HARMFUL BY INHALATION, IN CONTACT WITH
SKIN AND IF SWALLOWED. HYGROSCOPIC.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:MECHANICAL EXHAUST.
Protective Gloves:COMPATIBLE CHEMICAL RESISTANT GLOVES.
Eye Protection:CHEMICAL WORKERS GOGGLES .
Other Protective Equipment:NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.
Supplemental Safety and Health
SOLUBILITY IN WATER: ETHANOL-INSOLUBLE, WATER-SOLUBLE.

===== Physical/Chemical Properties =====

HCC:N1
Melt/Freeze Pt:M.P/F.P Text:1553F,845C
Spec Gravity:2.22
Solubility in Water:SUPP DATA
Appearance and Odor:POWDER

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NONE SPECIFIED BY MANUFACTURER.
Stability Condition to Avoid:HYGROSCOPIC
Hazardous Decomposition Products:NONE SPECIFIED BY MANUFACTURER.

===== Disposal Considerations =====

Waste Disposal Methods:DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE
SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN
AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE, AND LOCAL
LAWS.

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RORER PHARMACEUTICAL CORP -- EXTRA STRENGTH MAALOX PLUS SUSPENSION -- 6505-01-277-3914

=====
Product Identification
=====

Product ID:EXTRA STRENGTH MAALOX PLUS SUSPENSION

MSDS Date:08/15/1991

FSC:6505

NIIN:01-277-3914

MSDS Number: BMWVK

=== Responsible Party ===

Company Name:RORER PHARMACEUTICAL CORP

Address:500 ARCOLA RD (FRMLY:FT WASHINGTON, PA)

City:COLLEGEVILLE

State:PA

ZIP:19426-0109

Country:US

Info Phone Num:610-454-8421

Emergency Phone Num:610-454-8421

Preparer's Name:D.R. BLANKENBILLER

CAGE:04518

=== Contractor Identification ===

Company Name:RHONE-POULENC RORER PHARMACEUTICAL CORP, ARCOLA LABORATORIES

Address:500 ARCOLA RD

Box:1400

City:COLLEGEVILLE

State:PA

ZIP:19426-0109

Country:US

Phone:610-454-8421

CAGE:04518

=====
Composition/Information on Ingredients
=====

Ingred Name:PER MSDS NOT APPLICABLE COMPONENTS & CONTAMINANTS

RTECS #:9999999ZZ

Other REC Limits:NONE RECOMMENDED

=====
Hazards Identification
=====

Routes of Entry: Inhalation:NO Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:SKIN:PROLONGED SKIN CONTACT MAY CAUSE SKIN DRYNESS. INHAL:EXPOSURE THROUGH THIS ROUTE IS UNLIKELY WHEN USED AS DIRECTED. EYE:MAY CAUSE IRRIT. INGEST:NO ADVERSE HEALTH EFFECTS NOTED.

Effects of Overexposure:SKIN DRYNESS. EYE IRRIT.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:WASH OFF WITH SOAP & WATER. IF EXCESSIVE DRYNESS OR IRRITATION OCCURS GET MED ATTN. FLUSHH EYES WITH WATER FOR @LEAST 15MINS. GET MED ATTN. INGEST:GET MED ATTN.

=====
Fire Fighting Measures
=====

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, HALON OR WATER MAY BE

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USED.

Fire Fighting Procedures:NONE SPECIFIED BY MANUFACTURER.

Unusual Fire/Explosion Hazard:NONE

===== Accidental Release Measures =====

Spill Release Procedures:PREVENT LARGE AMTS OF PRODUCT FROM ENTERING SEWERS OR STREAMS. COLLECT PRODUCT AND DISPOSE OF ACCORDING FOT LOCAL, STATE AND FEDERAL REGULATIONS.

===== Handling and Storage =====

Handling and Storage Precautions:STORE AT ROOM TEMPERATURE. KEEP FROM FREEZING.

Other Precautions:PRODUCT DESCRIPTION:ALUMINA, MAGNESIA AND SIMETHICONE ORAL SUSPENSION.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NO RESPIRATORY PROTECTION REQUIRED.

Ventilation:IN NORMAL USE NO SPECIAL VENTILATION REQUIRED. GENERAL DILUTION VENTILATION RECOMMENDED WHEN WORKING W/LG QUANT OF PROD.

Protective Gloves:RECOMMENDED WHEN WORKING W/LG AMTS

Eye Protection:RECOMMEND SAF GOGG WHEN WORKING W/LG PRO

Other Protective Equipment:APPROPRIATE CLOTHING TO PREVENT CONTAMINATION OF PRODUCT IS RECOMMENDED.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:N1

Spec Gravity:1.14

pH:7.8

Viscosity:1200 CPS

Solubility in Water:SOLUBLE

Appearance and Odor:WHITE CREAMY SUSPENSION WITH CHARACTERISTIC ODOR.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

===== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL LOCAL, STATE AND FEDERAL REGULATIONS WHEN DISPOSING OF THIS PRODUCT.

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Material Safety Data Sheet
Magnesium acetate tetrahydrate

Material Safety Data Sheets, Carver Hall RM 208-A

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

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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.

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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

Section 16 - Additional Information

MSDS Creation Date: 7/14/1999

Revision #5 Date: 6/29/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet
Magnesium carbonate anhydrous

ACC# 13340

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium carbonate anhydrous

Catalog Numbers: AC413400000, AC413405000, S93288, M26-3, M27-12, M27-212, M27-500

Synonyms: Carbonate magnesium; Carbonic acid magnesium salt; Magnesite.

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
546-93-0	Magnesium carbonate	100	208-915-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: No hazard expected in normal industrial use. Used as antacid.

Inhalation: May cause respiratory tract irritation.

Chronic: Chronic, long-term exposure to dust may lead to "benign pneumoconiosis."

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

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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
Magnesium 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)

OSHA Vacated PELs: Magnesium carbonate: 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to 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: 0 mm Hg @ 20 deg C

Vapor Density: Not available.

Evaporation Rate: 0

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 350 deg C

Decomposition Temperature: 350 deg C

Solubility: Insoluble.

Specific Gravity/Density: 3.04 g/cm³

Molecular Formula: MgCO₃

Molecular Weight: 84.31

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 acids, formaldehyde.

Hazardous Decomposition Products: Carbon dioxide, oxides of magnesium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 546-93-0: OM2470000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 546-93-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

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# 546-93-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 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# 546-93-0 can be found on the following state right to know lists: Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

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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# 546-93-0: No information available.

Canada - DSL/NDSL

CAS# 546-93-0 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 4/24/1998

Revision #5 Date: 6/22/2006

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Magnesium chloride hexahydrate

ACC# 13365

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium chloride hexahydrate

Catalog Numbers: AC197530000, AC197530010, AC197530050, AC197530250, AC413410000, AC413410030, AC413411000, 41341-5000, BP214-500, BP2638, M33-3, M33-500, M33J500, M35-12, M35-212, M35-500, M3512LC, M35SAM1, M35SAM2, M35SAM3, M36-12, M36-212, M36SAM1, M36SAM2, M36SAM3

Synonyms: Magnesium dichloride hexahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7791-18-6	Magnesium chloride hexahydrate	99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to gray white solid.

Warning! Causes eye and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: Respiratory system, eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May cause respiratory tract irritation. Inhalation of fumes

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may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May be harmful if inhaled.

Chronic: May cause kidney damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: 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. 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. Material will not burn.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing.

Storage: Store in a cool, dry place. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: 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
Magnesium chloride hexahydrate	none listed	none listed	none listed
Magnesium chloride	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium chloride hexahydrate: No OSHA Vacated PELs are listed for this chemical. Magnesium 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 minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to gray white

Odor: none reported

pH: 7.0 (aq solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:117 deg C

Decomposition Temperature:Not available.

Solubility: Freely Soluble.

Specific Gravity/Density:1.56

Molecular Formula:MgCl₂.6H₂O

Molecular Weight:203.31

Section 10 - Stability and Reactivity

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Chemical Stability: Stable under normal temperatures and pressures. Deliquescent (tending to absorb atmospheric water vapor and become liquid).

Conditions to Avoid: Dust generation, moisture.

Incompatibilities with Other Materials: Attacks metals in the presence of moisture.

Hazardous Decomposition Products: Hydrogen chloride, chlorine.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7791-18-6: OM2975000

CAS# 7786-30-3: OM2800000

LD50/LC50:

CAS# 7791-18-6:

Oral, mouse: LD50 = 7600 mg/kg;

Oral, rat: LD50 = 8100 mg/kg;

CAS# 7786-30-3:

Oral, mouse: LD50 = 4700 mg/kg;

Oral, rat: LD50 = 2800 mg/kg;

Carcinogenicity:

CAS# 7791-18-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7786-30-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally,

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waste generators must consult state and local hazardous waste regulations to ensure 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# 7791-18-6 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# 7786-30-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7786-30-3: 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.

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OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7791-18-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7786-30-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37 Irritating to eyes and respiratory system.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

WGK (Water Danger/Protection)

CAS# 7791-18-6: 0

CAS# 7786-30-3: 0

Canada - DSL/NDSL

CAS# 7786-30-3 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

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997

Revision #11 Date: 7/30/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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WARDS NATURAL SCIENCE ESTABLISHMENT INC -- MAGNESIUM METAL POWDER -- -

=====
Product Identification
=====

Product ID:MAGNESIUM METAL POWDER
MSDS Date:04/27/1995
FSC:NIIN:Submitter:D DG
Status Code:A
MSDS Number: CLFDZ
==== Responsible Party ====
Company Name:WARDS NATURAL SCIENCE ESTABLISHMENT INC
Address:5100 W HENRIETTA RD
Box:92912
City:ROCHESTER
State:NY
ZIP:14692
Country:US
Info Phone Num:(716) 359-2502 OR 800-962-2660
Emergency Phone Num:(800)424-9300
Resp. Party Other MSDS Num.:MM 20
Preparer's Name:MICHAEL RASZEJA
Chemtrec Ind/Phone:(800)424-9300
CAGE:63759
==== Contractor Identification ====
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
Contract Num:MDA414-01P-1447
CAGE:63759

=====
Composition/Information on Ingredients
=====

Ingred Name:MAGNESIUM METAL
CAS:7439-95-4
RTECS #:OM2100000
= Wt:99.8

=====
Hazards Identification
=====

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EXPOSURE TO MAGNESIUM METAL OR OXIDE
DUST SHOULD BE A LOW HEALTH RISK BY INHALATION AND SHOULD BE
TREATED AS A NUISANCE DUST. EXPOSURE TO MAGNESIUM OXIDE FUME
SUBSEQUENT TO BURNING CAN RESULT IN METAL FUME FEVER. EYES: MAY
CAUSE BURNS AND CORNEAL ABRASIONS. SKIN: PARTICLES OF MAGNESIUM
EMBEDDED IN THE SKIN MAY PRODUCE LESIONS THAT RESIST HEALING.
INGESTION: NO PROBLEM BECAUSE OF PHYSICAL PROPERTIE S.
Effects of Overexposure:EXPOSURE TO MAGNESIUM METAL OR OXIDE DUST
SHOULD BE A LOW HEALTH RISK BY INHALATION AND SHOULD BE TREATED AS
A NUISANCE DUST. EXPOSURE TO MAGNESIUM OXIDE FUME SUBSEQUENT TO
BURNING CAN RESULT IN METAL FUME FEVER. EYES: MAY CAUSE BURNS AND
CORNEAL ABRASIONS. SKIN: PARTICLES OF MAGNESIUM EMBEDDED IN THE
SKIN MAY PRODUCE LESIONS THAT RESIST HEALING. INGESTION: NO PROBLEM
BECAUSE OF PHYSICAL PROPERTIE S.

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===== First Aid Measures =====

First Aid: EYE CONTACT: DO NOT FLUSH WITH WATER. REMOVE PARTICLES WITH COTTON TIP APPLICATOR. CORNEAL ABRASIONS ARE A POSSIBILITY. GET IMMEDIATE MEDICAL ATTENTION. INHALATION: REMOVE TO FRESH AIR. IF ILL EFFECTS DEVELOP, GET MEDICAL ATTENTION. SKIN: FLUSH THOROUGHLY WITH WATER, NO EFFECT EXPECTED. INGESTION: IF SWALLOWED, IF CONSCIOUS, INDUCE VOMITING AND CALL PHYSICIAN. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

===== Fire Fighting Measures =====

Flash Point: =635.C, 1175.F

Extinguishing Media: SMOTHER WITH DRY GRAPHITE, TALC, DRY SAND, G-1 POWDER, PURPLE K- DO NOT USE WATER. DO NOT USE FOAM, HALOGENATED EXTINGUISHING AGENTS, OR CARBON DIOXIDE.

Fire Fighting Procedures: DO NOT USE FOAM, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. PROTECT EYES & SKIN AGAINST FLYING PARTICLES. AVOID DIRECT VIEWING OF MAGNESIUM FIRES AS EYE INJURY MAY RESULT. FIREFIGHTERS SHOULD WEAR A NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS & PROTECTIVE CLOTHING. WEAR FIRE GLASSES WHEN VIEWING MAGNESIUM FIRES.

Unusual Fire/Explosion Hazard: COMBUSTIBLE METAL. EASILY IGNITED & BURNS WITH INTENSE HEAT & BRILLIANT WHITE FLAME. POWDERS FORM EXPLOSIVE MIXTURES WITH AIR WHICH MAY BE IGNITED BY A SPARK. IN FINELY DIVIDED FORM, WILL REACT WITH WATER & ACIDS TO RELEASE HYDROGEN; ALSO HAZARDOUS WITH CHLORINE, BROMIDE, IODINE, OXIDIZING AGENTS & ACIDS.

===== Accidental Release Measures =====

Spill Release Procedures: RECOVER FOR USE IF NOT CONTAMINATED. DO NOT USE WATER TO CLEAN UP SPILL. USE SAFETY EQUIPMENT-CLEAN UP USING NON-SPARKING TOOLS-NO SMOKING OR OPEN FLAMES IN AREA. AVOID DUSTING. CLEAN DRY PRODUCT MAY BE RETURNED TO DRY CONTAINER AND SEALED AGAINST MOISTURE OR SUITABLE CONTAINER FOR DISPOSAL. WET OR CONTAMINATED MATERIAL PLACED IN VENTED CONTAINERS AND MOVED TO REMOTE AREA FOR DISPOSAL BY BURNING.

===== Handling and Storage =====

Handling and Storage Precautions: STORE AT ROOM TEMPERATURE IN A DRY PLACE AWAY FROM OTHER COMBUSTIBLES IN A METAL CABINET. AVOID DIRECT VIEWING OF MAGNESIUM FIRES AS EYE INJURY MAY RESULT. GROUND ALL HANDLING AND TRANSFERRING OPERATIONS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE.

Other Precautions: READ LABEL OF CONTAINER BEFORE USING. DO NOT WEAR CONTACT LENSES WHEN WORKING WITH CHEMICALS. WET, MOIST OR HIGH HUMIDITY STORAGE CONDITIONS WILL LEAD TO CORROSION OF THE PRODUCT. CONSTANT CLEAN-UP AND GOOD HOUSEKEEPING. FOR LABORATORY USE ONLY. NOT FOR DRUG, FOOD OR HOUSEHOLD USE. KEEP OUT OF REACH OF CHILDREN.

===== Exposure Controls/Personal Protection =====

Respiratory Protection: NONE NEEDED IN NORMAL LABORATORY HANDLING. IF DUSTY CONDITIONS PREVAIL, WORK IN VENTILATION HOOD OR WEAR A

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NIOSH-APPROVED DUST MASK OR RESPIRATOR.
Ventilation:LOCAL EXHAUST OR MECHANICAL (GENERAL): IF DUSTY.
Protective Gloves:FIRE-RESISTANT.
Eye Protection:CHEMICAL SAFETY GLASSES, FIRE GLASSES.
Other Protective Equipment:WEAR APPROPRIATE FIRE RESISTANT CLOTHING
(E.G., GLOVES, COVERALLS, ETC). WHEN EXPOSING MAGNESIUM METAL TO
ELEVATED TEMPERATURES (950F) WHICH CAN CAUSE IGNITION. GOGGLES.
Work Hygienic Practices:CONSTANT CLEAN-UP AND GOOD HOUSEKEEPING.
Supplemental Safety and Health
NO DATA PROVIDED BY RESPONSIBLE PARTY.

===== Physical/Chemical Properties =====

HCC:R2
Boiling Pt:=1110.C, 2030.F
Melt/Freeze Pt:=650.C, #####F
Vapor Pres:1 MM @ 621C
Spec Gravity:1.74 @ 20C
Evaporation Rate & Reference:NON-VOLATILE.
Solubility in Water:NEGLIGIBLE (DECOMPOSES)
Appearance and Odor:SILVERY GRAY MEATAL POWDER; NO ODOR.
Percent Volatiles by Volume:NA

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
MAGNESIUM WILL REACT WITH WATER AND ACIDS TO RELEASE HYDROGEN; ALSO
HAZARDOUS WITH CHLORINE, BROMINE, IODINE, OXIDIZING AGENTS AND
ACIDS.
Stability Condition to Avoid:DANGEROUS WHEN WET. AVOID EXPOSURE TO
MOISTURE, HEAT, SPARKS AND FLAME.
Hazardous Decomposition Products:HYDROGEN WILL BE PRODUCED-WHEN EXPOSED
FOR LONG TIME TO WATER AND ACIDS.
Conditions to Avoid Polymerization:WILL NOT OCCUR.

===== Toxicological Information =====

Toxicological Information:NO DATA PROVIDED BY RESPONSIBLE PARTY.

===== Ecological Information =====

Ecological:NO DATA PROVIDED BY RESPONSIBLE PARTY.

===== Disposal Considerations =====

Waste Disposal Methods:DISCHARGE, TREATMENT, OR DISPOSAL MAY BE SUBJECT
TO FEDERAL, STATE OR LOCAL LAWS. THESE DISPOSAL GUIDELINES ARE
INTENDED FOR THE DISPOSAL OFF CATALOG-SIZE QUANTITIES ONLY. DISPOSE
OF IN AN APPROVED IN CINERATOR OR IN AN APPROVED CHEMICAL LANDFILL
OR CONTRACT WITH A INCENSED WASTE DISPOSAL SERVICE.

===== MSDS Transport Information =====

Transport Information:DOT: MAGNESIUM, POWDER, 4.3, UN1418.

===== Regulatory Information =====

SARA Title III Information:NO DATA PROVIDED BY RESPONSIBLE PARTY.

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Federal Regulatory Information:NO DATA PROVIDED BY RESPONSIBLE PARTY.
State Regulatory Information:NO DATA PROVIDED BY RESPONSIBLE PARTY.

===== Other Information =====

Disclaimer (provided with this information by the compiling agencies):
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of Defense. The United States of America in no manner whatsoever,
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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Magnesium nitrate hexahydrate

ACC# 13441

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium nitrate hexahydrate

Catalog Numbers: AC217560000, AC217560010, AC217565000, AC423880000, AC423880050, AC423885000, S73058, S73059, S80065, S93294, M46-212, M46-500

Synonyms: Magnesium dinitrate hexahydrate; Nitric acid, magnesium salt hexahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13446-18-9	Magnesium nitrate hexahydrate	>98	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless or white solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause eye, skin, and respiratory tract irritation. May cause central nervous system depression. May cause methemoglobinemia. May cause cardiac disturbances. May cause kidney damage.

Target Organs: Blood, kidneys.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. May cause nausea, vomiting, and diarrhea, possibly with blood. Excessive amounts of magnesium may cause central nervous system depression, respiratory

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paralysis, and cardiac

Inhalation: May cause respiratory tract irritation. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause effects similar to those described for ingestion.

Chronic: May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death. Repeated exposure may cause kidney damage and digestive tract abnormalities. Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: The use of Calcium disodium EDTA as a chelating agent should be determined by qualified medical personnel.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water with caution and in flooding amounts. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Use water only! Contact professional fire-fighters immediately. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

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General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Remove all sources of ignition. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium nitrate hexahydrate	none listed	none listed	none listed
Magnesium nitrate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium nitrate hexahydrate: No OSHA Vacated PELs are listed for this chemical. Magnesium nitrate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Material Safety Data Sheets, Carver Hall RM 208-A

Appearance: colorless or white
Odor: none reported
pH: 5.0-8.2; 5% solution
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 89 deg C
Decomposition Temperature: 330 deg C
Solubility: Soluble.
Specific Gravity/Density: 1.46 (water=1)
Molecular Formula: MgN₂O₆.6H₂O
Molecular Weight: 256.41

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Deliquescent (tending to absorb atmospheric water vapor and become liquid).

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Reducing agents, organic materials, combustible materials.

Hazardous Decomposition Products: Nitrogen oxides, oxides of magnesium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 13446-18-9: OM3756000

CAS# 10377-60-3 unlisted.

LD50/LC50:

CAS# 13446-18-9:

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 500 mg/24H Mild;

Oral, rat: LD50 = 5440 mg/kg;

CAS# 10377-60-3:

Carcinogenicity:

CAS# 13446-18-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 10377-60-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Material Safety Data Sheets, Carver Hall RM 208-A

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	MAGNESIUM NITRATE	MAGNESIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1474	UN1474
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13446-18-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 10377-60-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 13446-18-9: immediate, delayed, fire.

Section 313

This material contains Magnesium nitrate hexahydrate (listed as Water Dissociable Nitrate Compounds), >98%, (CAS# 13446-18-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Magnesium nitrate anhydrous (listed as Water Dissociable Nitrate Compounds), -%, (CAS# 10377-60-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 13446-18-9 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 10377-60-3 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

○

Risk Phrases:

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

WGK (Water Danger/Protection)

CAS# 13446-18-9: 1

CAS# 10377-60-3: 1

Canada - DSL/NDSL

CAS# 10377-60-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C.

This product has been classified in accordance with the hazard criteria of the Controlled Products

Material Safety Data Sheets, Carver Hall RM 208-A

Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 13446-18-9 is not listed on the Canadian Ingredient Disclosure List.

CAS# 10377-60-3 is not listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997

Revision #8 Date: 9/18/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet
Magnesium Oxide, Reagent ACS (Powder)

ACC# 96229

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium Oxide, Reagent ACS (Powder)

Catalog Numbers: AC423890000, AC423890500, AC423895000

Synonyms: Magnesia; Calcined Magnesium; Calcined Brucite

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
1309-48-4	Magnesium oxide	100	215-171-9

Hazard Symbols: None listed.

Risk Phrases: None listed.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white. **Caution!** May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Inhalation of fumes may cause metal-fume fever. Hygroscopic (absorbs moisture from the air). May cause central nervous system depression.

Target Organs: Central nervous system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression.

Inhalation: May cause respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: 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.

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.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam. Do NOT get water inside containers.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Wash area with soap and water. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

Material Safety Data Sheets, Carver Hall RM 208-A

Keep from contact with moist air and steam.

Storage: Store in a cool, dry place. Keep away from water. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium oxide	10 mg/m ³ TWA (inhalable fraction)	750 mg/m ³ IDLH (fume)	15 mg/m ³ TWA (total particulate)

OSHA Vacated PELs: Magnesium oxide: 10 mg/m³ TWA (total particulate)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Odorless

pH: 10 (sat. solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 3600 deg C

Freezing/Melting Point: 2500-2800C

Decomposition Temperature: Not available.

Solubility: Slightly soluble in water

Specific Gravity/Density: 3.65-3.75

Molecular Formula: MgO

Molecular Weight: 40.3044

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, moisture, exposure to air.

Incompatibilities with Other Materials: Strong oxidizing agents; reacts violently with phosphorous pentachloride, chlorine trichloride, or bromine pentafluoride. Will absorb CO₂ from air.

Hazardous Decomposition Products: None.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 1309-48-4: OM3850000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 1309-48-4:

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: See 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

Material Safety Data Sheets, Carver Hall RM 208-A

	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# 1309-48-4 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.

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# 1309-48-4 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:

Material Safety Data Sheets, Carver Hall RM 208-A

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1309-48-4: 1

Canada - DSL/NDSL

CAS# 1309-48-4 is listed on Canada's DSL List.

Canada - WHMIS

WHMIS: Not available.

Canadian Ingredient Disclosure List

CAS# 1309-48-4 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 1309-48-4: OEL-ARAB Republic of Egypt: TWA 10 mg/m³ OEL-AUSTRALIA: TWA 10 mg/m³ JANUARY 1993 OEL-BELGIUM: TWA 10 mg/m³ JANUARY 1993 OEL-DENMARK: TWA 6 mg/m³ OEL-FRANCE: TWA 10 mg/m³ JANUARY 1993 OEL-GERMANY: TWA 6 mg/m³ OEL-GERMANY: TWA 6 mg/m³ JANUARY 1993 OEL-HUNGARY: TWA 5 mg/m³; STEL 10 mg/m³ OEL-THE NETHERLANDS: TWA 10 mg/m³ JANUARY 1993 OEL-THE PHILIPPINES: TWA 15 mg/m³ JANUARY 1993 OEL-POLAND: TWA 15 mg/m³ OEL-RUSSIA: STEL 5 mg/m³ OEL-SWITZERLAND: TWA 6 mg/m³ OEL-SWITZERLAND: TWA 6 mg/m³; STEL 12 mg/m³ JANUARY 1993 OEL-TURKEY: TWA 15 mg/m³ OEL-UNITED KINGDOM: TWA 10 mg/m³ JANUARY 1993 OEL-UNITED KINGDOM: TWA 10 mg/m³ (total dust) OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 5/14/1998

Revision #3 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet Magnesium, reagent (ribbon)

ACC# 00872

Section 1 - Chemical Product and Company Identification

MSDS Name: Magnesium, reagent (ribbon)

Catalog Numbers: AC413380000, 41338-0250

Synonyms: Magnesium metal (ribbons/turnings)

Company Identification:

Fisher Scientific
1 Reagent Lane

Material Safety Data Sheets, Carver Hall RM 208-A

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7439-95-4	Magnesium	100	231-104-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: not available solid.

Warning! Water-reactive. May cause mechanical eye and skin irritation. May cause respiratory tract irritation. Inhalation of fumes may cause metal-fume fever. Air sensitive. Moisture sensitive.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation. Particles embedded in the skin may cause "chemical gas gangrene" with symptoms of persistent lesions, inflammation and gas bubbles under the skin.

Ingestion: May cause irritation of the digestive tract. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid. Wash mouth out with water.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: The use of calcium gluconate as antidotal treatment for magnesium over dose should be determined only by qualified medical personnel (Medical Toxicology, 1988).

Section 5 - Fire Fighting Measures

General Information: Water reactive. Material will react with water and may release a flammable and/or toxic gas. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. Flammable solid. May react with acids or moisture to form explosive hydrogen gas.

Extinguishing Media: Use only graphite powder, soda ash, powdered sodium chloride, or an appropriate metal-fire-extinguishing dry powder. Do NOT use water, carbon dioxide, or foam.

Flash Point: Not applicable.

Autoignition Temperature: 472.8 deg C (883.04 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Scoop up with a nonsparking tool, then place into a suitable container for disposal. 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. 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. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Water free area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations

Material Safety Data Sheets, Carver Hall RM 208-A

below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Magnesium	none listed	none listed	none listed

OSHA Vacated PELs: Magnesium: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: not available

Odor: None reported.

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Negligible.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 1107 deg C @ 760.00mm Hg

Freezing/Melting Point: 651 deg C

Decomposition Temperature: Not available.

Solubility: reacts with water

Specific Gravity/Density: 1.7400g/cm³

Molecular Formula: Mg

Molecular Weight: 24.30

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, exposure to air, exposure to moist air or water.

Incompatibilities with Other Materials: Oxygen, moisture, chlorinated solvents, methanol, hydrogen peroxide, oxidizing agents, sulfur compounds, metal oxides, metal cyanides, metal oxide salts, fluorine, carbonates, halogens, phosphates.

Hazardous Decomposition Products: Oxides of magnesium.

Hazardous Polymerization: Has not been reported.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 11 - Toxicological Information

RTECS#:**CAS#** 7439-95-4: FW6475100**LD50/LC50:**

Not available.

Carcinogenicity:

CAS# 7439-95-4: 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# 7439-95-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7439-95-4: 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 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# 7439-95-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

F

Risk Phrases:

R 11 Highly flammable.

R 15 Contact with water liberates extremely flammable gases.

Safety Phrases:

S 7/8 Keep container tightly closed and dry.

S 43A In case of fire, use dry chemical (never use water).

Material Safety Data Sheets, Carver Hall RM 208-A

WGK (Water Danger/Protection)

CAS# 7439-95-4: No information available.

Canada - DSL/NDSL

CAS# 7439-95-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4.

This product has been classified in accordance with 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

MSDS Creation Date: 9/02/1997

Revision #4 Date: 11/05/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet Manganese(IV) dioxide

ACC# 13610

Section 1 - Chemical Product and Company Identification

MSDS Name: Manganese(IV) dioxide

Catalog Numbers: AC193470000, AC193470050, AC203190000, AC203190030, AC203190050, AC203191000, AC203195000, AC213490000, AC213490010, AC213490250, AC222580000, AC222580050, AC222580500, AC222581000, AC222585000, AC357790000, AC357790050, AC357790500, S75734, S75737, S93297, S93298, M108-500, NC9348319, NC9353110

Synonyms: Black manganese oxide; Manganese dioxide; Manganese(IV) oxide; Manganese peroxide; Manganese binoxide; Manganese black; Battery manganese; Manganese superoxide; occurs in nature as the mineral pyrolusite.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

Material Safety Data Sheets, Carver Hall RM 208-A

CAS#	Chemical Name	Percent	EINECS/ELINCS
1313-13-9	Manganese dioxide	>80	215-202-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: black crystalline powder.

Danger! Strong oxidizer. Contact with other material may cause a fire. Harmful if inhaled or swallowed. May cause eye, skin, and respiratory tract irritation. May cause central nervous system effects. Inhalation of fumes may cause metal-fume fever. May cause adverse reproductive effects based upon animal studies.

Target Organs: Central nervous system, lungs, reproductive system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingestion of large amounts may cause CNS depression. In high doses, manganese may increase anemia by interfering with iron absorption. Although they are poorly absorbed through the intestine, inorganic manganese salts may produce hypoglycemia and decreased calcium blood levels should absorption occur.

Inhalation: May cause respiratory tract irritation. Harmful if inhaled. Aspiration may cause severe pneumonia. The lowest exposure concentration of manganese at which early effects on the CNS and the lungs may occur is still unknown. However, once neurological signs are present, they tend to continue and worsen after exposure ends.

Chronic: Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. Adverse reproductive effects have been reported in animals. Other chronic effects from inhaling high amounts of manganese include an increased incidence of cough and bronchitis and susceptibility to infectious lung disease.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased

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apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe dust, mist, or vapor. Keep container tightly closed. Do not ingest or inhale. Keep from contact with clothing and other combustible materials. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Store in a cool, dry place. Store in a tightly closed container. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

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Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Manganese dioxide	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.).500 mg/m ³ IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).

OSHA Vacated PELs: Manganese dioxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: black

Odor: odorless

pH: 6.2 (1500 g/L aq.sol.)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point:535 deg C

Decomposition Temperature:535 deg C

Solubility: Insoluble.

Specific Gravity/Density:5.02

Molecular Formula:MnO₂

Molecular Weight:86.94

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Organic matter, azides, hydrogen peroxide, sulfur, sulfides, phosphides, hypophosphites, strong reducing agents, combustible materials, aldehydes, alcohols, acids (mineral, non-oxidizing, e.g. hydrochloric acid, hydrofluoric acid, muriatic acid, phosphoric acid), acids (organic, e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid).

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Hazardous Decomposition Products: Oxygen, oxides of manganese.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1313-13-9: OP0350000

LD50/LC50:

CAS# 1313-13-9:

Oral, rat: LD50 = >3478 mg/kg;

Carcinogenicity:

CAS# 1313-13-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The U.S. EPA stated that epidemiological studies of inorganic manganese compounds in humans indicate effects on the respiratory system at levels below 1 mg/m³.

Teratogenicity: No information available.

Reproductive Effects: Men exposed to manganese dusts showed a decrease in fertility.

Mutagenicity: No information found

Neurotoxicity: Manganese is neurotoxic.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, N.O.S.	OXIDIZING SOLID NOS (MANGANESE DIOXIDE)
Hazard Class:	5.1	5.1
UN Number:	UN1479	UN1479
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1313-13-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 1313-13-9: delayed, fire.

Section 313

This material contains Manganese dioxide (listed as Manganese compounds, n.o.s.), >80%, (CAS# 1313-13-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 1313-13-9 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1313-13-9 can be found on the following state right to know lists: California, (listed as Manganese compounds, n.o.s.), New Jersey, Pennsylvania, (listed as Manganese compounds, n.o.s.), Minnesota, (listed as Manganese compounds, n.o.s.).

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California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

Safety Phrases:

S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 1313-13-9: 1

Canada - DSL/NDSL

CAS# 1313-13-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 1313-13-9 (listed as Manganese compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 5/14/1998

Revision #5 Date: 6/08/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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ALCAN METAL POWDERS, DIV OF ALCAN ALUM CORP -- MD-301; MANGANESE POWDER -- 6810-00N000492

=====
Product Identification
=====

Product ID:MD-301; MANGANESE POWDER
MSDS Date:01/01/1985
FSC:6810
NIIN:00N000492

MSDS Number: BCFPN
=== Responsible Party ===
Company Name:ALCAN METAL POWDERS, DIV OF ALCAN ALUM CORP
Emergency Phone Num:201-353-4605
CAGE:G0877

=== Contractor Identification ===
Company Name:ALCAN METAL POWDERS, DIV OF ALCAN ALUM CORP
CAGE:G0877
Company Name:ALCAN-TOYO AMERICA INC AFFIL OF ALCAN ALUMINUM CORP
Address:1717 N NAPER BLVD SUITE 201
Box:City:NAPERVILLE
State:IL
ZIP:60540
Country:US
Phone:708-505-2160
CAGE:76424

=====
Composition/Information on Ingredients
=====

Ingred Name:MANGANESE
Fraction by Wt: 100%
ACGIH TLV:C, 5MG/CUM

=====
Hazards Identification
=====

Effects of Overexposure:TOXIC. AFFECTS NERVOUS SYSTEM. MAY INDUCE
DISABLING PARALYSIS.

=====
First Aid Measures
=====

First Aid:REMOVE FROM EXPOSURE IMMED, SEEK MD.

=====
Fire Fighting Measures
=====

Extinguishing Media:DRY SAND
Unusual Fire/Explosion Hazard:MODERATE FIRE & EXPLO HAZ IN FORM OF DUST
WHEN EXPOSED TO FLAME

=====
Accidental Release Measures
=====

Spill Release Procedures:WEAR PROT CLTHNG, GOGGLES & RESP. SPRINKLE
MODERATELY W/SAND, COLLECT FOR DISPOSAL AVOIDING DUST CLOUDS AS
MUCH AS POSS.

=====
Handling and Storage
=====

Handling and Storage Precautions:STORE IN COOL DRY PLACE, AVOID RAISING
DUST CLOUD, RESP & GOGGLES SHOULD BE WORN AT ALL TIMES.
Other Precautions:PERSONAL HYGIENE, SHOWER, WASH THOROUGHLY BEFORE
EATING OR SMOKING, FREQUENT CHANGE OF WORK CLOTHES, UNDER, SOCKS.

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===== Exposure Controls/Personal Protection =====

Respiratory Protection:APPRVD RESP, NIOSH/MSHA
Ventilation:EXPLO-PROOF VENT EQUIP. NO SMOKING
Protective Gloves:LIGHT PLASTIC
Eye Protection:GOGGLES
Other Protective Equipment:PROT CLTHNG, HAIR COVERING
Supplemental Safety and Health
VAP PRESS IS MEASURED AT 1292 C. THE MELTING POINT IS 1260C. THE MFG
SUGGESTS CONSULTING THE NFPA MANUAL OF HAZARDOUS CHEMICAL
REACTIONS.

===== Physical/Chemical Properties =====

NRC/State Lic Num:NA
Boiling Pt:B.P. Text:1900C
Vapor Pres:1.0
Spec Gravity:7.2000
Evaporation Rate & Reference:NA
Solubility in Water:NEGLIGIBLE
Appearance and Odor:GRAY OR SILVERY-ODORLESS
Percent Volatiles by Volume:0.0

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
HALOGENS, AL & AIR. NITROGEN & SULFUR DIOXIDE, PHOSPHORUS
Stability Condition to Avoid:STRONG ACIDS, WATER, STEAM, OPEN FLAME,
HOT SURFACES
Hazardous Decomposition Products:WILL REACT W/WATER OR STEAM TO PRODUCE
HYDROGEN

===== Disposal Considerations =====

Waste Disposal Methods:PUT IN CLOSED METAL CNTNR, DISPOE IAW FED,
STATE, LOCAL REG

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particular situation.

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FISHER SCIENTIFIC -- MANGANOUS SULFATE MONOHYDRATE, M-118 -- 6810-00N037635

=====
Product Identification
=====

Product ID:MANGANOUS SULFATE MONOHYDRATE, M-118
MSDS Date:10/05/1990
FSC:6810
NIIN:00N037635
MSDS Number: BQVWN
=== 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:ING 16: THAT GIVEN ABOVE. ANTIDOTE SHLD BE ADMIN BY
QUALIFIED MED PERSONNEL.
RTECS #:9999999ZZ

Ingred Name:SPILL PROC:OR OTHER ABSORB & PLACE IN CNTNRS FOR DISP. LRG
SPILLS: DIKE FAR AHEAD OF SPILL FOR DISP. KEEP UNNEC (ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 18: PEOPLE AWAY. ISOLATE HAZARD AREA AND DENY ENTRY.
RTECS #:9999999ZZ

Ingred Name:RESP PROT:RESP. SCBA. 250 MG(MN)/M3: HIGH-EFFICIENCY
PARTICULATE RESP. SUPPLIED-AIR RESP W/FULL FACEPIECE, (ING 21)

Ingred Name:ING 20:HELMET OR HOOD. SCBA W/A FULL FACEPIECE. 5000
MG(MN)/M3: POWERED AIR-PURIFYING RESP W/HIGH EFFICIENCY (ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 21:FILTER. TYPE C SUPPLIED-AIR RESP OPERATED IN
PRESS-DEMAND/OTHER POSITIVE PRESSURE OR CONTINUOUS-FLOW
MODE. (ING23)
RTECS #:9999999ZZ

Ingred Name:ING 22:10,000 MG(MN)/M3: TYPE C SUPPLIED-AIR RESP W/FULL
FACEPIECE OPERATED IN PRESS-DEMAND OR OTHER POSITIVE (ING 24)
RTECS #:9999999ZZ

Ingred Name:ING 23: PRESSURE MODE OR WITH FULL FACEPIECE, HELMET OR

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HOOD OPERATED IN CONTINUOUS FLOW MODE.
RTECS #:9999999ZZ

Ingred Name:ING 2:MANGANESE SALTS ARE POORLY ABSORBED BUT MAY CAUSE
GASTRITIS, NAUS, DIARR, & HYPOGLYCEMIA.CHRONIC: MAY CAUSE(ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3:SYMP S IMILAR TO INHALATION INCLUDING SEVERE CNS
DISTURBANCES.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC:TIGHTLY. GET MED ATTN IMMED. EYE:WASH IMMED
W/LRG AMTS OF WATER/NORMAL SALINE, OCCASNLY LIFTING (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:UPPER & LOWER LIDS, FOR @ LST 15 MIN/UNTIL NO
EVIDENCE OF CHEM REMAINS. GET MED ATTN IMMED. INGEST: (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6:TREAT SYMPTOMATICALLY & SUPPORTIVELY. GET MED ATTN
IMMED. IF VOMIT OCCURS, KEEP HEAD LOWER THAN HIPS TO (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7: PREVENT ASPIRATION. ANTIDOTE:CALCIUM EDETATE EFTIVE
IN REMOVING MANGANESE, BUT HAS NO PERM EFT ON (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8:SYMPTOMATIC PATIENTS IN LATE STAGES OF
MANGANISM.ADMIN OF CALCIUM DISODIUM EDETATE RECOMMENDED. EDETATE
IS(ING 10)

Ingred Name:ING 9:AVAIL AS 5 ML AMPULES OF 20% SOLN.GIVE 15-25 MG/KG
(0.08-0.125 ML OF 20% SOLN PER KG BODY WT) IN 250-500 (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10:ML OF 5% DEXTROSE INTRAVENOUSLY OVER A 1-2 HR PERIOD
TWICE DAILY. MAX DOSE SHLD NOT EXCEED 50 MG/KG/DAY. (ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11:DRUG SHLD BE GIVEN IN 5-DAY COURSES W/REST PERIOD OF
@ LST 2 DAYS BETWEEN COURSES. AFTER FIRST COURSE, (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 13:SUBSEQUENT COURSES SHLD NOT EXCEED 50 MG/KG/DAY.
DAILY URINALYSIS SHLD BE DONE DURING TREATMENT PERIOD. (ING 14)
RTECS #:9999999ZZ

Ingred Name:ING 13:DOSAGE SHLD BE REDUCED IF ANY UNUSUAL URINARY
FINDINGS APPEAR. INTRAVENOUS ADMIN IS CONTRAINDICATED IN (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14:PRESENCE OF ELEVATED CEREBROSPINAL FLUID PRESS.FOR
INTRAMUSCULAR ADMIN, GIVE 20% SOLN (20 MG/ML), 12.5 (ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15:MG/KG BODY WT EVERY 4-6 HRS.DILUTE EACH DOSE W/AN
EQUAL VOLUME OF 1% PROCAINE. DOSE LIMITATION IS SAME AS(ING 17)
RTECS #:9999999ZZ

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Ingred Name:MANGANESE, MONOSULFATE, MONOHYDRATE; (MANGANOUS SULFATE MONOHYDRATE)

CAS:10034-96-5

RTECS #:OP0893500

OSHA PEL:5 MG/M3, C;1 FUME

ACGIH TLV:5 MG/M3 DUST; 1 FUME

Ingred Name:SUPP DATA:SKIN:ACUTE: MAY CAUSE IRRIT. EYE: ACUTE: DIRECT CNTCT MAY CAUSE IRRIT & LACRIMATION. INGEST: ACUTE: (ING 3)

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:10,000 PPM (MN) IMMED DANGEROUS TO LIFE OR HEALTH. ACUTE: MAY CAUSE COUGHING, CHOKING, & TRACHEAL IRRIT. CHRONIC: MAY CAUSE HDCH, RESTLESS SLEEP, DROWSINESS, IRRIT, DIZZINESS, HYPOTENSION, PATHO LOGIC LAUGHTER OR GIDDINESS, CONVULSIONS, VISUAL HALLUCINATIONS, DOUBLE (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HLTH HAZ:VISION, IMPAIRED HEARING, UNCONTROLLABLE IMPULSES, MENTAL CONFUSION, EUPHORIA, EXCESSIVE SALIVATION, CHILLS, FEVER, ACHING MUSCLES, DRYNESS IN MOUTH & THROAT, BRONCHITIS AND PNEUMONITIS & IMP OTENCE. AFTER A PRLNGD PERIODS OF TIME, SYMPS OF PARKINSONS' DISEASE MAY APPEAR. THESE INCL MASK-LIKE FACIAL (SUPP DATA)

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:INHAL:REMOVE 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/SOAP/MILD DETERGENT & LRG AMTS OF WATER UNTIL NO EVIDENCE OF CHEM REMAINS. IN CASE OF CHEM BURNS, COVER AREA W/STERILE, DRY DRESSING. BANDAGE SECURELY, BUT NOT TOO (ING 5)

===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR REGULAR FOAM. LRG FIRES: USE WATER SPRAY, FOG OR REGULAR FOAM.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT . NO ACUTE HAZ. MOVE CNTNR FROM FIRE AREA IF POSSIBLE. AVOID BRTHG VAPOR OR DUST;KEEP UPWIND.

Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures:KEEP COMBUST (WOOD, PAPER, OIL, ETC.) AWAY FROM SPILLED MATL. DO NOT TOUCH SPILLED MATL. FOR SMALL DRY SPILLS, W/CLEAN SHOVEL PLACE MATL INTO CLEAN, DRY CNTNR & COVER; MOVE CNTNRS FROM SPILL AREA. FOR SML LIQ SPILLS, TAKE UP W/SAND, EARTH (ING 18)

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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 APPRVD:AS DUST/MIST:25 MG(MN) /M3:DUST & MIST RESP, EXCEPT SINGLE USE. 50 MG(MN) /M3:DUST & MIST RESP, EXCEPT SINGLE USE & QUARTER-MASK RESP.AS DUST, MIST/FUME:50 MG(MN) /M3:FUME/HIGH EFFICIEN CY PARTICULATE RESP.SUPPLIED-AIR(ING 20)

Ventilation:PROVIDE LOC EXHST VENT AND/OR GEN DILUTION VENT TO MEET PUBLISHED EXPOSURE LIMITS.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:CHEM WORK GOG W/FULL LNGTH FSHLD .

Other Protective Equipment:EYE WASH FOUNTAIN & QUICK DRENCH SHOWER WITHIN IMMED WORK AREA FOR EMER USE. APPROP PROT (IMPERVIOUS) CLTHG & EQUIP.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

EFTS OF OVEREXP: EXPRESSIONS, MUSCLE WEAKNESS AND RIGIDITY, SALIVATION, TREMORS OF THE UPPER EXTREMITIES AND HEAD, STAGGERING AND SLURRED SPEECH. MAY ALSO CAUSE LIVER, KIDNEY AND PERMANENT BRAIN DMG. OTHER SYMPS MAY INCLUDE LEUCOPENIA, ELEVATED ERYTHROCYTE COUNTS, AND INCREASED OSMOTIC FRAGILITY OF THE BLOOD. (ING 2)

==== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:135F,57C

Spec Gravity:2.9

Solubility in Water:INSOLUBLE IN ALCOHOL

Appearance and Odor:PALE RED, SLIGHTLY EFFLORESCENT CRYSTALS

==== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NONE KNOWN.

Stability Condition to Avoid:AVOID HEATING TO DECOMPOSITION.

Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE TOXIC OXIDES OF SULFUR.

==== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS .

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Material Safety Data Sheet
Marble chips

ACC# 12795

Section 1 - Chemical Product and Company Identification

MSDS Name: Marble chips

Catalog Numbers: M123-3

Synonyms: Limestone; Natural calcium carbonate.

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
1317-65-3	Limestone	100	215-279-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: gray to tan solid.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust causes mechanical irritation.

Ingestion: Low hazard for usual industrial handling.

Inhalation: Dust is irritating to the respiratory tract.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. 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 extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: 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. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place.

Section 8 - Exposure Controls, Personal Protection

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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
Limestone	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)
Calcium carbonate	none listed	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust) (listed under Calcium carbonate).	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction) (listed under Calcium carbonate).

OSHA Vacated PELs: Limestone: 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
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: gray to tan

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: 897.8 deg C

Decomposition Temperature: 897.8 deg C

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: CaCO₃

Molecular Weight: 100.0782

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: High temperatures, incompatible materials.

Incompatibilities with Other Materials: Acids, aluminum, strong oxidizers, magnesium.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 1317-65-3: EV9580000

CAS# 471-34-1: FF9335000

LD50/LC50:

Not available.

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# 1317-65-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 471-34-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Please refer to RTECS for specific information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1317-65-3 is listed on the TSCA inventory.

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:

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None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1317-65-3 can be found on the following state right to know lists: Pennsylvania, Minnesota, Massachusetts.

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:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 1317-65-3: No information available.

CAS# 471-34-1: 0

Canada - DSL/NDSL

CAS# 471-34-1 is listed on Canada's DSL List.

CAS# 1317-65-3 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 471-34-1 is not listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997

Revision #5 Date: 11/08/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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Mercuric chloride

- Mercury(II) chloride
- Mercury dichloride
- Mercury bichloride

Formula HgCl₂



Description An odorless white crystalline solid. Slightly volatile at ordinary temperatures.

Uses Used in photography, disinfectants, wood preservatives, fungicides.

Registry Numbers and Inventories.

CAS 7487-94-7

NIH PubChem CID 5284416

EC (EINECS/ELINCS) 231-299-8

EC Index Number 080-010-00-X

EC Class T+; R28, T; R48/24/25, C; R34, N; R50-53

RTECS OV9100000

RTECS class Agricultural Chemical and Pesticide; Tumorigen; Drug; Mutagen; Reproductive Effector; Human Data; Primary Irritant

UN (DOT) 1624

Merck 13,5901

Beilstein/Gmelin 9301 (G)

RCRA D009

Material Safety Data Sheets, Carver Hall RM 208-A

Swiss Giftliste 1	G-2099
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	Cl ₂ Hg
Formula mass	271.50
Melting point, °C	273
Boiling point, °C	302
Vapor pressure, mm _{Hg}	0.1 (100 C)
Vapor density (air=1)	9.8
Density	5.44 g/cm ³
Solubility in water	69 g/L
Dipole moment	1.43 D
Partition coefficient, pK _{ow}	0.22
Heat of fusion	17.4 kJ/mol

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Hazards and Protection.

Storage

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light.

Handling

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Minimize dust generation and accumulation. Do not breathe dust, vapor, mist, or gas. Do not get on skin or in eyes. Do not ingest or inhale. Store protected from light.

Protection

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Small spills/leaks

Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.

Stability

Stable at room temperature in closed containers under normal storage and handling conditions.

Incompatibilities

Formates, sulfites, hypophosphites, phosphates, albumin, gelatin, alkalies, alkaloid salts, ammonia, lime water, antimony, arsenic, bromides, borax, carbonates, reduced iron, copper, iron, lead, silver salts, infusions of cinchona, columbo, oak bark or senna, tannic acid, vegetable astringents, potassium, sodium, metallic halides, strong oxidizing agents, strong bases.

Decomposition

Mercury/mercury oxides, chloride fumes.

Fire.

Fire fighting

Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible. 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. In case of fire use water fog, dry

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chemical, carbon dioxide or alcohol type foam.

Fire potential

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Hazards

Material may explode on heating, with friction, or contact with alkali metals, sulfides, acetylene, ammonia, and oxalic acid. Upon decomposition highly toxic chloride and mercury fumes are emitted. Avoid formates, sulfites, hypophosphites, phosphates, sulfides, albumin, gelatin, alkalies, alkaloid salts, ammonia, lime water, antimony, arsenic, bromides, borax, carbonates, reduced iron, copper, iron, lead, silver salts, infusions of cinchona, columbo, oak bark or senna, and tannic acid. Mercuric chloride may explode with friction or application of heat. Mixtures of mercuric chloride and sodium or potassium are shock sensitive and will explode on impact. Avoid contact with acids or acid fumes.

Combustion products

Fire may produce irritating, corrosive and/or toxic gases.

NFPA

Health 4

Flammability 0

Reactivity 0

Health.

Exposure limit(s)

TLV (as Hg): ppm; 0.1 mg/m³ (skin) (ACGIH 1991-1992).

Poison_Class

2

Exposure effects

Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause reproductive and fetal effects. Chronic ingestion may cause accumulation of mercury in body tissues. Laboratory experiments have resulted in mutagenic effects. May be rapidly transferred across the placenta and cause adverse fetal effects.

Ingestion

May be fatal if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Causes gastrointestinal tract burns. May cause muscle tremor and impaired motor function. May cause cardiac disturbances.

Inhalation

May cause central nervous system effects including vertigo, anxiety, depression, muscle incoordination, and emotional instability. May cause gastrointestinal effects including gum and mouth inflammation, jaw necrosis, and loosening of the teeth. May cause burns to the respiratory

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tract. Acute exposure to high concentrations of mercury vapors may cause severe respiratory tract irritation.

Skin May be fatal if absorbed through the skin. Causes severe skin irritation and possible burns.

Eyes Exposure to mercury or mercury compounds can cause discoloration on the front surface of the lens, which does not interfere with vision. Causes severe eye irritation and possible burns. Contact with mercury or mercury compounds can cause ulceration of the conjunctiva and cornea.

First aid

Ingestion Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. SPEED IS ESSENTIAL. A DOCTOR MUST BE NOTIFIED AT ONCE. Wash mouth out with water.

Inhalation Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Skin Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure. Destroy contaminated shoes. SPEEDY ACTION IS CRITICAL, GET MEDICAL AID IMMEDIATELY.

Eyes Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation is required (at least 30 minutes).

Transportation.

UN number 1624

Response guide [154](#)

Hazard class 6.1



Packing Group II

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USCG CHRIS Code

MRC

HS Code

2827 39 80

Std. Transport #

4923245 4923271

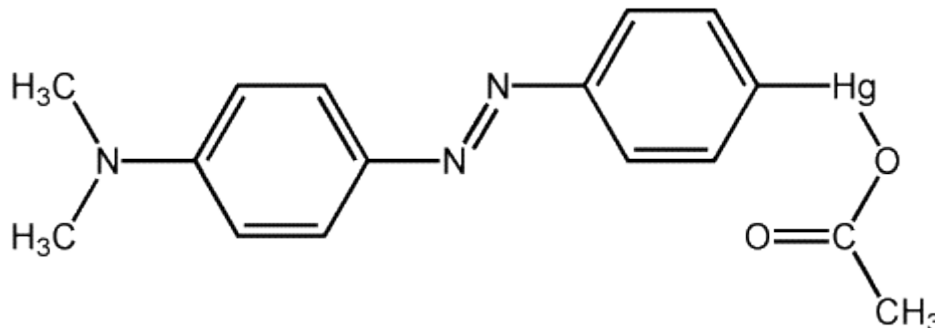
4-(p-Dimethylaminobenzeneazo)phenyl mercuric acetate

- Mercury, (acetato-kappaO)[4-[[4-(dimethylamino)phenyl]azo]phenyl]-

Formula

C₁₆H₁₇HgN₃O₂

Structure



Registry Numbers and Inventories.

CAS	19447-62-2
NIH PubChem CID	16684035
UN (DOT)	2025
Beilstein/Gmelin	3684430
Beilstein Reference	4-16-00-01759
Canada DSL/NDSL	NDSL
US TSCA	Listed

Properties.

Formula	C ₁₆ H ₁₇ HgN ₃ O ₂
Formula mass	483.92

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT

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GET WATER INSIDE CONTAINERS.

Stability No data.

Fire.

Fire fighting Use method most appropriate to fight surrounding fire.
Fire potential Non-Combustible
Combustion products Fire may produce irritating, corrosive and/or toxic gases.

Health.

Exposure effects The toxicological properties of this substance have not been fully investigated.

Inhalation Highly toxic, may be fatal if inhaled, swallowed or absorbed through skin. Effects of contact or inhalation may be delayed.

Skin Avoid any skin contact. See Inhalation.

Eyes See Inhalation.

First aid

Ingestion Seek medical assistance.

Inhalation Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.

Skin Remove and isolate contaminated clothing and shoes. Remove material from skin immediately. Immediately flush with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin.

Eyes Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 2025



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FISHER SCIENTIFIC CO CHEMICAL DIV. -- MERCURIC IODIDE -- 6810-00-247-0600

=====
Product Identification
=====

Product ID:MERCURIC IODIDE
MSDS Date:05/13/1989
FSC:6810
NIIN:00-247-0600
MSDS Number: BMCBM
=== 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
Address:2000 PARK LN
Box:City:PITTSBURGH
State:PA
ZIP:15275
Country:US
Phone:412-490-8586
CAGE:22527
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 IODIDE
CAS:7774-29-0
RTECS #:OW5250000
Fraction by Wt: 100%
Other REC Limits:NONE SPECIFIED

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL RAT) IS 40 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/CHRONIC: MAY CAUSES DYSPNEA,
LABORED BREATHING, DELAYED PULMONARY EDEMA, SKIN IRRITATION,
SERIOUS BURNS & PERMANENT VISION LOSS, CORNEAL OPACIFICATION &
NECROSIS, COLLAPSE OR DEATH, MERCURIALISM , DERMATITIS, METALLIC
TASTE, SALIVATION, GINGIVITIS, LOOSING OF THE TEETH, PYORRHEA, SKIN
ERUPTIONS, & BLUE GUM LINE.
Explanation of Carcinogenicity:THIS COMPOUND CONTAINS NO INGREDIENTS AT
CONCENTRATIONS OF 0.1% OR GREATER THAT ARE CARCINOGENS OR SUSPECT
CARCINOGENS.

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Effects of Overexposure:MAY CAUSE FEVER, VOMITING DIARRHEA, INFLAMATION OF THE MOUTH. MAY ALSO CAUSE HEADACHE, DIZZINESS, PAIN, NUMBNESS OF THE EXTREMITIES, PSYCHIC DISTURBANCES, PERIPHERAL NEUROPATHY AND NAUSEA. MAY CAUSE COUGHING, LABORED BREATHING, WEAKNESS, NUMBNESS, DIGESTIVE DISORDERS, COLLAPSE AND IN SEVERE CASES, DEATH.

Medical Condition Aggravated by Exposure:SENSITIZATION DERMATITIS MAY OCCUR IN PREVIOUSLY EXPOSED WORKERS.

===== First Aid Measures =====

First Aid:EYES: FLUSH WITH RUNNING WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION IMMEDIATELY. SKIN: WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. GET MEDICAL ADVICE. INHALATION: REMOVE TO FRESH AIR. GIVE MOUTH-TO-MOUTH RESUSCITATION IF NOT BREATHING. GET MEDICAL ATTENTION. INGESTION: REMOVE BY GASTRIC LAVAGE OR EMESIS. GIVE OXYGEN IF RESPIRATION IS DEPRESSED. CALL DOCTOR.

===== Fire Fighting Measures =====

Flash Point:NON-FLAMMABLE

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, HALON, WATER SPRAY OR STANDARD FOAM. FOR LARGE FIRES USE WATER SPRAY, FOG OR STANDARD FOAM

Fire Fighting Procedures:MOVE CONTAINERS FROM FIRE IF POSSIBLE. USE AGENT SUITABLE FOR TYPE OF SURROUNDING FIRE. USE WATER IN FLOODING AMOUNTS AS FOG. AVOID BREATHING POISONOUS VAPORS.

Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures:TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL & PUT IN DISPOSAL CONTAINER FOR LATER DISPOSAL. FOR SMALL DRY SPILLS, WITH A CLEAN SHOVEL PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER. REMOVE CONTAINER FROM SPILL AREA.

===== Handling and Storage =====

Handling and Storage Precautions:NONE SPECIFIED BY MANUFACTURER.

Other Precautions:NONE

===== Exposure Controls/Personal Protection =====

Respiratory Protection:SELECT A NIOSH/MSHA APPROVED RESPIRATOR BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE.

Ventilation:LOCAL EXHAUST TO PROVIDE ADEQUATE VENTILATION.

Protective Gloves:NOT REQUIRED, BUT RECOMMENDED.

Eye Protection:SPLASH-PROOF OR DUST-PROOF GOGGLES

Other Protective Equipment:PROTECTIVE CLOTHING NOT REQUIRED. AVOID REPEATED OR PROLONGED CONTACT WITH THIS SUBSTANCE.

Work Hygienic Practices:EYE WASH STATION & SAFETY SHOWER.

Supplemental Safety and Health

MERCURY POISONING: GIVE DIMERCAPROL, 3 MG/KG (OR 0.3 ML/KG) EVERY 4 HOURS FOR THE FIRST 2 DAYS AND THEN 2 MG/KG EVERY 12 HOURS FOR A TOTAL OF 10 DAYS. DIMERCAPROL IS AVAILABLE AS A 10% SOLUTION IN OIL FOR INTRAMUSCULAR ADMINISTRATION. HEMODIALYSIS WILL SPEED THE REMOVAL OF THE MERCURY-DIMERCAPROL COMPLEX.

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===== Physical/Chemical Properties =====

HCC:T2

Boiling Pt:B.P. Text:662F,350C

Melt/Freeze Pt:M.P/F.P Text:261F,127C

Spec Gravity:6.0

Solubility in Water:0.01%

Appearance and Odor:ODORLESS, RED CRYSTALS, TURNS YELLOW WHEN HEATED.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

CHLORINE TRIFLUORIDE: REACTION WITH FLAME, POTASSIUM: STRONG EXPLOSION
ON CONTACT, SODIUM: STRONG EXPLOSION ON CONTACT.

Stability Condition to Avoid:MAY BURN BUT DOES NOT IGNITE READILY.

Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS MAY
INCLUDE HIGHLY TOXIC FUMES OF IODIDES.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE MADE IN ACCORDANCE WITH
APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

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assume responsibility for the suitability of this information to their
particular situation.

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J.T.BAKER INC. -- MERCURIC IODIDE, RED -- 6810-00-247-0600

=====
Product Identification
=====

Product ID:MERCURIC IODIDE, RED

MSDS Date:09/14/1989

FSC:6810

NIIN:00-247-0600

MSDS Number: BDNLB

=== Responsible Party ===

Company Name:J.T.BAKER INC.

Address:222 RED SCHOOL LANE

City:PHILLIPSBURG

State:NJ

ZIP:08865-2219

Country:US

Info Phone Num:201-859-2151

Emergency Phone Num:908-859-2151/800-424-9300 (CHEMTREC)

CAGE:HO852

==== Contractor Identification ====

Company Name:J.T.BAKER INC.

Address:222 RED SCHOOL LANE

Box:City:PHILLIPSBURG

State:NJ

ZIP:08885

Phone:201-859-2151

CAGE:HO852

Company Name:MALLINCKRODT BAKER, INC.

Address:222 RED SCHOOL LANE

Box:City:PHILLIPSBURG

State:NJ

ZIP:08865

Country:US

Phone:800-582-2537

CAGE:70829

=====
Composition/Information on Ingredients
=====

Ingred Name:MERCURIC IODIDE

CAS:7774-29-0

RTECS #:OW5250000

Fraction by Wt: 95.0%

OSHA PEL:S, C, 0.1 MG/M3 (HG)

ACGIH TLV:S, 0.1 MG/M3 (HG)

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 ORAL, RAT=40MG/KG

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE:INHAL:RESP IRRIT, HARMFUL & MAY BE FATAL. SKIN/EYE:SEVERE IRRI OR BURNS. INGEST:HARMFUL & MAY BE FATAL. CHRONIC:EYE:PROLONGED CONTACT MAY CAUSE PERMANENT CORNEAL DAMAGE, BLINDNESS. MERCURY BUILD -UP IN BRAIN, LIVER, KIDNEYS.

Effects of Overexposure:INHAL:HEADACHE, COUGHING, DIZZINESS, DIFFICULT IN BREATHING. SKIN:REDNESS, BURNS. EYE:REDNESS, DISCOMFORT, PERMANENT CORNEAL DAMAGE, BLINDNESS. INGEST:NAUSEA, VOMITING, FATAL. SHAKES, LOOSE TEETH, LOS S OF APPETITE, SKIN ULCERATION, IMPAIRED MEMORY.

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Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:INGEST:CALL DOCTOR. IF CONSCIOUS IMMEDIATELY INDUCE VOMITING. GIVE MILK OR WHITES OF RAW EGGS BEATEN W/MILK. INHAL:REMOVE TO FRESH AIR. IF NOT BREATH GIVE ARTIFICIAL RESP. IF BREATH DIFFICULT GIVE OXYGEN. SKIN:IMMEDIATELY FLUSH W/LOTS OF WATER FOR @ LEAST 15MINS WHILE REMOVING CONTAMINATED CLOTHING/SHOES. EYE:IMMEDIATELY FLUSH W/LOTS OF WATER FOR @ LEAST 15MINS.

===== Fire Fighting Measures =====

Extinguishing Media:USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.
Fire Fighting Procedures:FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT & SCBA W/FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE W/O RISK.
Unusual Fire/Explosion Hazard:CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR SCBA & FULL PROTECTIVE CLOTHING. W/CLEAN SHOVEL CAREFULLY PLACE MATERIAL INTO CLEAN, DRY CONTAINER & COVER. REMOVE FROM AREA. FLUSH SPILL AREA W/WATER.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN SECURE POISON AREA. KEEP AWAY FROM HEAT, SUNLIGHT; KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. SAF-T-DATA STORAGE COLOR CODE:BLUE (HEALTH)
Other Precautions:AVOID CONTACT W/EYES AND SKIN. DO NOT INHALE DUST/MIST.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION EXCEEDS TLV A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.
Ventilation:USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.
Protective Gloves:NEOPRENE
Eye Protection:GOGGLES/FACE SHIELD
Other Protective Equipment:FULL WORK CLOTHING TO PREVENT REPEATED OR PROLONGED CONTACT.
Work Hygienic Practices:WASH HANDS THOROUGHLY AFTER HANDLING. LAUNDRY CONTAMINATED CLOTHING/SHOES PRIOR TO REUSE.
Supplemental Safety and Health
UPDATED MSDS.

===== Physical/Chemical Properties =====

HCC:T4
Boiling Pt:B.P. Text:662F/350C
Melt/Freeze Pt:M.P/F.P Text:498F,259C
Decomp Temp:Decomp Text:NOT KNOWN

Material Safety Data Sheets, Carver Hall RM 208-A

Vapor Density:16.0
Spec Gravity:6.28
Solubility in Water:NEGLIGIBLE
Appearance and Odor:SCARLET RED,HEAVY ODORLESS POWDER.
Percent Volatiles by Volume:0 @21C

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
POTASSIUM, SODIUM, INTER-HALOGENS (EX:BROMINE TRIFLUORIDE).
Stability Condition to Avoid:HEAT,LIGHT
Hazardous Decomposition Products:MERCURY FUMES, IODINE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND
FEDERAL REGULATIONS. EPA HAZ WASTE NO:D009 (EP TOXIC WASTE).

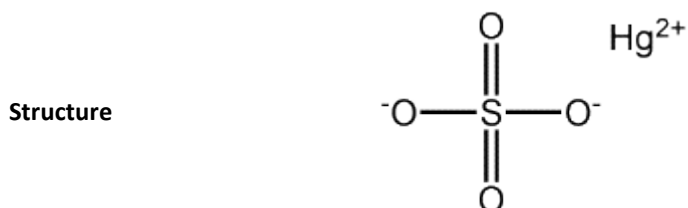
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particular situation.

Material Safety Data Sheets, Carver Hall RM 208-A

Mercuric sulfate

- Mercury bisulfate
- Mercury(II) sulfate

Formula HgSO₄



Description Odorless white granules or crystalline powder.

Uses Electrolyte for primary batteries, with sodium chloride for extracting gold and silver from roasted pyrites, as reagent for wine coloring, barbital, and cysteine.

Registry Numbers and Inventories.

CAS	7783-35-9
NIH PubChem CID	24544
EC (EINECS/ELINCS)	231-992-5
EC Index Number	080-002-00-6
EC Class	T+; R26/27/28, R33, N; R50-53
RTECS	OX0500000
RTECS class	Other
UN (DOT)	1645
Merck	13,5914
Beilstein/Gmelin	32386 (G)

Material Safety Data Sheets, Carver Hall RM 208-A

RCRA	D009
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	HgO ₄ S
Formula mass	296.65
Melting point, °C	850
Vapor pressure, mm _{Hg}	0.0012
Vapor density (air=1)	17.
Odor threshold	Odorless.
Density	5.995 g/cm ³ (21 C)
Solubility in water	Decomposes
Heat of fusion	6.0 kJ/mol

Hazards and Protection.

Material Safety Data Sheets, Carver Hall RM 208-A

Storage	Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Poison room locked.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Store protected from light.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
Small spills/leaks	Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.
Disposal code	20
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Substance decomposes when exposed to water, violently reacts with hydrogen chloride, and is corrosive to many metals (including aluminum, copper, iron, magnesium, lead, and zinc).
Decomposition	Oxides of sulfur, mercury/mercury oxides.

Fire.

Autoignition, °C	> 450	
Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes. Extinguishing media: Use foam, dry chemical, or carbon dioxide. Use agent most appropriate to extinguish fire.	
Fire potential	Nonflammable.	
Combustion products	None	
NFPA	Health	2

Material Safety Data Sheets, Carver Hall RM 208-A

Flammability 0

Reactivity 0

Health.

Exposure limit(s) NIOSH REL: C 0.1 mg/m³ [skin] OSHA PEL: C 0.1 mg/m³ 10 mg/m³ (as Hg)

Poison_Class 2 (Very strong toxins)

Exposure effects Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. May cause anemia and other blood cell abnormalities. Repeated exposure may cause central nervous system damage.

Ingestion Harmful if swallowed. May cause kidney damage. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract. May cause adverse nervous system effects and possible

Inhalation May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. May cause effects similar to those described for ingestion.

Skin May be absorbed through the skin. May cause severe irritation and possible burns.

Eyes Contact may cause severe eye irritation and possible eye damage.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Skin Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Material Safety Data Sheets, Carver Hall RM 208-A

Transportation.

UN number 1645

Response guide [151](#)

Hazard class 6.1



Packing Group II

USCG CHRIS Code MRS

HS Code 2833 29 70

Std. Transport # 4923257

Material Safety Data Sheets, Carver Hall RM 208-A

Mercury(I) chloride

- Mercurous chloride
- Mercury(1+) chloride
- Chloromercury
- Precipite blanc
- Cyclosan
- Mild mercury chloride

Formula	HgCl
Structure	Hg—Cl
Description	White solid.
Uses	Fungicide, insecticide.

Registry Numbers and Inventories.

CAS	7546-30-7
NIH PubChem CID	24182
EC (EINECS/ELINCS)	231-430-9
EC Index Number	080-002-00-6
EC Class	T+; R26/27/28, R33, N; R50-53
RTECS	OV8750000
RTECS class	Agricultural Chemical and Pesticide; Mutagen
UN (DOT)	2025
Beilstein/Gmelin	37841 (G)
Canada DSL/NDSL	DSL

Material Safety Data Sheets, Carver Hall RM 208-A

US TSCA Listed

Korea ECL Listed

Philippiens PICCS Listed

Properties.

Formula	ClHg
Formula mass	236.04
Melting point, °C	525
Odor threshold	Odorless
Density	7.15 g/cm ³ (20 C)
Solubility in water	Insoluble
Heat of fusion	15.1 kJ/mol

Hazards and Protection.

Storage	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.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get on skin and clothing. Do not ingest or inhale.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators	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.

Material Safety Data Sheets, Carver Hall RM 208-A

Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.
Stability	Stable under normal temperatures and pressures. May decompose when exposed to light.
Incompatibilities	Substance may react with acacia, ammonia, alkali chlorides, bromides, carbonates, cocaine, copper salts, cyanides, hydroxides, iodine, iodoform, lead salts, silver salts, soap, sulfates, and sulfites.
Decomposition	Hydrogen chloride, mercury/mercury oxides.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible. Extinguishing media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Fire potential	Non-Combustible
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

NFPA	Health	2
	Flammability	0
	Reactivity	0

Health.

Exposure effects	Prolonged or repeated inhalation of dusts may cause neurological damage. May cause kidney injury. May cause tremors, irritability, loss of memory and intellect. May also cause Pink disease characterized by skin, cardiovascular, and neurobehavioral abnormalities.
Ingestion	Harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause kidney failure. May cause severe digestive tract irritation with abdominal pain, nausea,

Material Safety Data Sheets, Carver Hall RM 208-A

vomiting and diarrhea. May cause weakness, fatigue, vascular collapse, and esophagus damage.

Inhalation

May cause respiratory tract irritation. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause kidney damage.

Skin

May cause skin irritation. May be harmful if absorbed through the skin.

Eyes

May cause eye irritation. Contact may cause ulceration of the conjunctiva and cornea.

First aid

Ingestion

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately. Induce vomiting by giving one teaspoon of Syrup of Ipecac.

Inhalation

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. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Skin

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Eyes

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 2025

Response guide [151](#)

Hazard class 6.1



Packing Group I; II; III

Material Safety Data Sheets, Carver Hall RM 208-A

USCG CHRIS Code

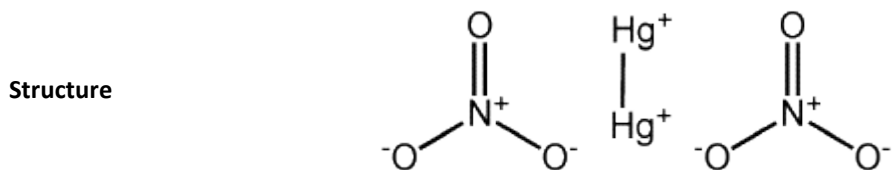
MRR

Material Safety Data Sheets, Carver Hall RM 208-A

Mercurous nitrate

- Dimercury dinitrate

Formula $\text{Hg}_2(\text{NO}_3)_2$



Description A white solid. Usually exists as the dihydrate.

Uses Fire gilding, blackening brass.

Registry Numbers and Inventories.

CAS 10415-75-5

NIH PubChem CID 25247

EC (EINECS/ELINCS) 233-886-4

RTECS OW8000000

RTECS class Other

UN (DOT) 1627

Merck 12,5954

Beilstein/Gmelin 48108 (G)

RCRA D009

Swiss Giftliste 1 G-2826

Canada DSL/NDSL DSL

Material Safety Data Sheets, Carver Hall RM 208-A

US TSCA	Listed
Austrailia AICS	Listed
New Zealand	Listed
Japan ENCS (MITI)	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	HgNO ₃
Formula mass	525.19
Melting point, °C	-38.9
Vapor density (air=1)	1.9
Density	4.78 g/cm ³ (20 C)
Solubility in water	Soluble

Hazards and Protection.

Storage Keep containers tightly closed. Keep away from light.

Handling All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.

Protection Protect against both inhalation and absorption through the skin. Niosh-approved self-contained breathing apparatus must be worn. Rubber gloves, hooded rubber suits and rubber boots must be worn.

Material Safety Data Sheets, Carver Hall RM 208-A

Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Keep material out of water sources and sewers.
Stability	May be explosive if shocked or heated. At high temperature mixture of substance and carbon decomposes explosively, a mixture of substance and phosphorus explodes when struck.
Incompatibilities	May react explosively.

Fire.

Fire fighting	Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Use foam, dry chemical, or carbon dioxide. Keep run-off water out of sewers and water sources.
Fire potential	Oxidizer.
Hazards	May explode from heat or contamination.
Combustion products	Smoke from fire may contain toxic mercury vapor and oxides of nitrogen.

<u>NEPA</u>	Health	3
	Flammability	1
	Reactivity	1

Health.

Poison_Class	2
Exposure effects	
Ingestion	Initial effects of ingestion are gastric irritation with nausea, vomiting and abdominal pain.
Inhalation	Respiratory depression and cyanosis may be noted, due to methemoglobinemia.

Material Safety Data Sheets, Carver Hall RM 208-A

Skin Cyanosis that minimally responds to oxygen therapy may be noted, and is indicative of probable methemoglobinemia.

Eyes See Skin.

First aid

Ingestion Immediate life support measures should be provided because of associated hypotension, seizures, and methemoglobinemia-induced anoxia. Emesis: ipecac-induced vomiting is not recommended because of the potential for seizures.

Inhalation Move patient to fresh air. Monitor for respiratory distress. Administer oxygen and assist ventilation as required. Treatment should include recommendations listed in the oral exposure section when appropriate.

Skin Remove and isolate contaminated clothing and shoes. Immediately flush with running water for at least 20 minutes.

Eyes Irrigate exposed eyes with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

Transportation.

UN number 1627

Response guide [141](#)

Hazard class 6.1



Packing Group II

USCG CHRIS Code MRN

Std. Transport # 4921871 4918752

Material Safety Data Sheets, Carver Hall RM 208-A

Mercurous oxide

- Mercury(I) oxide
- Mercury oxide black

Formula Hg₂O



Description Black or brownish-black powder. Not a true compound but rather an intimate mixture of metallic mercury and mercuric oxide.

Registry Numbers and Inventories.

CAS	15829-53-5
NIH PubChem CID	16683011
EC (EINECS/ELINCS)	239-934-0
RTECS	OW8700000
RTECS class	Other
UN (DOT)	1641
Merck	12,5955
Beilstein/Gmelin	33377 (G)
RCRA	D009
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed

Material Safety Data Sheets, Carver Hall RM 208-A

Korea ECL Listed

Philippiens PICCS Listed

Properties.

Formula	Hg ₂ O
Formula mass	417.18
Melting point, °C	-38.9
Boiling point, °C	356.6
Vapor pressure, mm _{Hg}	0.0012
Density	13.6 g/cm ³ (20 C)
Solubility in water	Insoluble

Hazards and Protection.

Storage	Keep in a cool, dry, dark location in a tightly sealed container or cylinder. Keep away from incompatible materials, ignition sources and untrained individuals. Secure and label area. Protect containers/cylinders from physical damage.
Handling	All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.
Protection	Bureau of mines approved airline respirator; impervious suit; appropriate eye protection.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Keep material out of water sources and sewers.
Stability	No data.

Material Safety Data Sheets, Carver Hall RM 208-A

Incompatibilities Reacts with hydrochloric acid to give insoluble mercurous chloride (calomel) Mixtures with phosphorus or sulfur explode by impact and friction respectively,.

Fire.

Fire fighting Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Use water in flooding quantities as fog. Use foam, dry chemical, or carbon dioxide.

Fire potential Non-Combustible

Hazards Containers may explode when heated. Runoff may pollute waterways.

Combustion products Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Health.

Exposure limit(s) IDHL: 10 mg/m³ (as Hg)

Exposure effects tremor, confusion, loss of coordination, hyperreflexia, and lethargy may follow acute mercuric chloride ingestion. Chronic exposure can cause fatigue, headache, weakness, decreased concentration, anxiety, emotional lability, irritability and delirium. Mercuric chloride has been associated with spontaneous abortions in humans. It has been embryotoxic, fetotoxic, and teratogenic, and has affected the testes and sperm in rodents.

Inhalation Dyspnea, rales, and severe tracheal, laryngeal and pulmonary edema have occurred following ingestion and aspiration of inorganic mercury salts. Clinical findings similar to the adult respiratory distress syndrome (ARDS) have also been reported.

Skin Mercury pigmentation, dermatitis and symptoms of acrodynia have resulted from use of creams containing inorganic mercury salts. Burns or irritation can result from some inorganic mercury compounds.

Eyes See Inhalation.

First aid

Ingestion Seek medical assistance.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation

Move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.

Skin

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Eyes

Immediately flush with running water for at least 20 minutes.

Transportation.

UN number 1641

Response guide [151](#)

Hazard class 6.1



Packing Group II

Std. Transport # 4923251

Material Safety Data Sheet
Acid Fast, Fluorescent Auramine Component

ACC# 91177

Section 1 - Chemical Product and Company Identification

MSDS Name: Acid Fast, Fluorescent Auramine Component

Catalog Numbers: BP2714-250, BP2715-250

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
56-81-5	Glycerol	<50.0	200-289-5
7732-18-5	Deionized Water	25.5+	231-791-2
64-17-5	Ethyl alcohol	<19.0	200-578-6
108-95-2	Phenol	<4.0	203-632-7
67-56-1	Methyl alcohol	<1.0	200-659-6
2465-27-2	Auramine O	<0.5	219-567-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow liquid.

Warning! Causes eye, skin, and respiratory tract irritation. **Combustible liquid and vapor.** May be harmful if swallowed, inhaled, or absorbed through the skin. May cause cancer based on animal studies.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye irritation.

Material Safety Data Sheets, Carver Hall RM 208-A

Skin: Causes skin irritation. May be absorbed through the skin in harmful amounts. Dermatitis may result from contact with phenol or phenol-containing products.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: Causes severe respiratory tract irritation. May be harmful if inhaled.

Chronic: Not available. Auramine O has been shown to cause cancer based on animal

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Combustible liquid. 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.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

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. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

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. 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 explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Glycerol	10 mg/m ³ TWA	none listed	15 mg/m ³ TWA (total); 5 mg/m ³ TWA (respirable fraction)
Deionized Water	none listed	none listed	none listed
Ethyl alcohol	1000 ppm TWA	1000 ppm TWA; 1900 mg/m ³ TWA 3300 ppm IDLH	1000 ppm TWA; 1900 mg/m ³ TWA
Phenol	5 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route	5 ppm TWA; 19 mg/m ³ TWA 250 ppm IDLH	5 ppm TWA; 19 mg/m ³ TWA
Methyl alcohol	200 ppm TWA; 250 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route	200 ppm TWA; 260 mg/m ³ TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m ³ TWA
Auramine O	none listed	none listed	none listed

OSHA Vacated PELs: Glycerol: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
 Deionized Water: No OSHA Vacated PELs are listed for this chemical. Ethyl alcohol: 1000 ppm TWA; 1900 mg/m³ TWA Phenol: 5 ppm TWA; 19 mg/m³ TWA Methyl alcohol: 200 ppm TWA; 260 mg/m³ TWA
 Auramine O: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: yellow

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stability unknown.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat.

Incompatibilities with Other Materials: Oxidizing agents, acetic anhydride, (aniline + nitrobenzene), Ca(OCl)₂, chromium trioxide, chromic oxide, (fluoride + lead monoxide), (HClO₄ + lead monoxide), potassium permanganate, K₂O₂, silver perchlorate, sodium peroxide, NaH, aluminum chloride + nitromethane (at 110°C/100 bar), formaldehyde, peroxydisulfuric acid, peroxymonosulfuric acid, sodium nitrite + heat, aluminum chloride + nitrobenzene (at 120°C), sodium nitrate + trifluoroacetic acid, butadiene, chloroform + sodium methoxide, diethyl zinc, alkyl aluminum salts, acetyl bromide, chloroform + sodium hydroxide, CrO₃, cyanuric chloride, (I + ethanol + HgO), Pb(ClO₄)₂, HClO₄, P₂O₃, (KOH + CHCl₃), nitric acid, beryllium dihydride, metals (e.g., potassium, magnesium), oxidants (e.g., barium perchlorate, bromine, sodium hypochlorite, chlorine, hydrogen peroxide), potassium tert-butoxide, carbon tetrachloride + metals (e.g., aluminum, magnesium, zinc), dichloromethane.

Hazardous Decomposition Products: Carbon monoxide, oxides of nitrogen, carbon dioxide, chloride fumes, ammonia.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 56-81-5: MA8050000

CAS# 7732-18-5: ZC0110000

CAS# 64-17-5: KQ6300000

Material Safety Data Sheets, Carver Hall RM 208-A

CAS# 108-95-2: SJ3325000

CAS# 67-56-1: PC1400000

CAS# 2465-27-2: BY3675000

LD50/LC50:

CAS# 56-81-5:

Draize test, rabbit, eye: 126 mg Mild;
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;
Inhalation, rat: LC50 = >570 mg/m³/1H;
Oral, mouse: LD50 = 4090 mg/kg;
Oral, rabbit: LD50 = 27 gm/kg;
Oral, rat: LD50 = 12600 mg/kg;
Skin, rabbit: LD50 = >10 gm/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 64-17-5:

Draize test, rabbit, eye: 500 mg Severe;
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 20 mg/24H Moderate;
Inhalation, mouse: LC50 = 39 gm/m³/4H;
Inhalation, rat: LC50 = 20000 ppm/10H;
Oral, mouse: LD50 = 3450 mg/kg;
Oral, rabbit: LD50 = 6300 mg/kg;
Oral, rat: LD50 = 7060 mg/kg;
Oral, rat: LD50 = 9000 mg/kg;

CAS# 108-95-2:

Draize test, rabbit, eye: 5 mg Severe;
Draize test, rabbit, skin: 500 mg/24H Severe;
Draize test, rabbit, skin: 100 mg Mild;
Inhalation, mouse: LC50 = 177 mg/m³;
Inhalation, mouse: LC50 = 177 mg/m³/4H;
Inhalation, rat: LC50 = 316 mg/m³;
Inhalation, rat: LC50 = 316 mg/m³/4H;
Oral, mouse: LD50 = 270 mg/kg;
Oral, rat: LD50 = 317 mg/kg;
Oral, rat: LD50 = 512 mg/kg;
Skin, rabbit: LD50 = 630 mg/kg;
Skin, rat: LD50 = 669 mg/kg;
Skin, rat: LD50 = 1500 mg/kg;

CAS# 67-56-1:

Draize test, rabbit, eye: 40 mg Moderate;
Draize test, rabbit, eye: 100 mg/24H Moderate;
Draize test, rabbit, skin: 20 mg/24H Moderate;
Inhalation, rabbit: LC50 = 81000 mg/m³/14H;
Inhalation, rat: LC50 = 64000 ppm/4H;
Oral, mouse: LD50 = 7300 mg/kg;

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Oral, rabbit: LD50 = 14200 mg/kg;
Oral, rat: LD50 = 5600 mg/kg;
Skin, rabbit: LD50 = 15800 mg/kg;

CAS# 2465-27-2:

Oral, mouse: LD50 = 480 mg/kg;

Carcinogenicity:

CAS# 56-81-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 64-17-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 108-95-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 67-56-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 2465-27-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found.

Teratogenicity: No information found.

Reproductive Effects: Cas# 56-81-5: TDLo(Intratesticular, rat)= 280 mg/kg; Paternal Effects - spermatogenesis (incl. genetic material, sperm morphology, motility, and count); testes, epididymis, sperm duct TDLo (Intraperitoneal, rat)= 600 mg/kg; Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).

Mutagenicity: Cas# 108-95-2: Mutation in microorganisms(Bacteria - Salmonella typhimurium) = 40 umol/plate.

Neurotoxicity: No information found.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Cas# 56-81-5: LC50 Goldfish= >5000 mg/l/24 hr - modified ASTM D 1345 Cas# 64-17-5: LC50 salmo gairdnerii (rainbow trout)= 13000 MG/L/96HR Static bioassay LC50 Pimephales promelas (fathead minnows)= 15.3 g/l/96 hr; water hardness, Flow-through bioassay. Cas# 67-56-1: LC50 Pimephales promelas (fathead minnows) 29.4 g/l/96 hr, Conditions of bioassay not specified.

Environmental: Cas# 56-81-5 . Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/l at 5 deg C, bioconcentration factors for glycerin can be estimated at 3 and 0.2, respectively, using regression-derived equations. The magnitude of these values indicate that bioconcentration of glycerin in fish and aquatic organisms will not be significant. Cas# 64-17-5: TERRESTRIAL FATE: When spilled on soil, ethanol will both evaporate and leach into the ground due to the relatively high vapor pressure and low adsorption in soil. It will biodegrade in soil.

Physical: No information found.

Other: Cas# 67-56-1: Methanol is expected to be biodegradable in soil based on its miscibility in water and log Kow (-0.77); therefore, suggesting a high mobility in soil. A large number of screening studies have found methanol to be significantly biodegradable. Aquatic hydrolysis, oxidation, photolysis, adsorption to sediment, and bioconcentration are not significant. The bioconcentration factor of methanol experimentally measured in fish (golden ide) was less than 10. Based on a log Kow of -0.77, the BCF value for methanol can be estimated to be 0.2.

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Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, 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# 108-95-2: waste number U188.

CAS# 67-56-1: waste number U154 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 56-81-5 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 64-17-5 is listed on the TSCA inventory.

CAS# 108-95-2 is listed on the TSCA inventory.

CAS# 67-56-1 is listed on the TSCA inventory.

CAS# 2465-27-2 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 108-95-2: 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

None of the chemicals are listed under TSCA Section 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# 108-95-2: 1000 lb final RQ; 454 kg final RQ CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ

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SARA Section 302 Extremely Hazardous Substances

CAS# 108-95-2: 500 lb lower threshold TPQ; 10000 lb upper threshold TP Q

SARA Codes

CAS # 56-81-5: delayed.

CAS # 64-17-5: immediate, delayed, fire.

CAS # 108-95-2: immediate, delayed, fire.

CAS # 67-56-1: immediate, fire.

CAS # 2465-27-2: immediate, delayed.

Section 313

This material contains Phenol (CAS# 108-95-2, <4.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Methyl alcohol (CAS# 67-56-1, <1.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 108-95-2 is listed as a hazardous air pollutant (HAP).

CAS# 67-56-1 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:

CAS# 108-95-2 is listed as a Hazardous Substance under the CWA. CAS# 108-95-2 is listed as a Priority Pollutant under the Clean Water Act. CAS# 108-95-2 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 56-81-5 can be found on the following state right to know lists: Pennsylvania, Minnesota, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 64-17-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 108-95-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 2465-27-2 can be found on the following state right to know lists: New Jersey, Pennsylvania.

California Prop 65

WARNING: This product contains Ethyl alcohol, a chemical known to the state of California to cause developmental reproductive toxicity.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

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)

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CAS# 56-81-5: 0

CAS# 7732-18-5: No information available.

CAS# 64-17-5: 0

CAS# 108-95-2: 2

CAS# 67-56-1: 1

CAS# 2465-27-2: 2

Canada - DSL/NDSL

CAS# 56-81-5 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 64-17-5 is listed on Canada's DSL List.

CAS# 108-95-2 is listed on Canada's DSL List.

CAS# 67-56-1 is listed on Canada's DSL List.

CAS# 2465-27-2 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# 64-17-5 is listed on the Canadian Ingredient Disclosure List.

CAS# 108-95-2 is listed on the Canadian Ingredient Disclosure List.

CAS# 67-56-1 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 2/18/1999

Revision #8 Date: 1/11/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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SHERWIN-WILLIAMS CO -- MOLD CLEANER INHIBITOR, S00251 -- 6850-00N083637

=====
Product Identification
=====

Product ID:MOLD CLEANER INHIBITOR, S00251

MSDS Date:09/01/1996

FSC:6850

NIIN:00N083637

MSDS Number: CGQNN

=== Responsible Party ===

Company Name:SHERWIN-WILLIAMS CO

Address:31500 SOLON RD

City:SOLON

State:OH

ZIP:44139

Country:US

Info Phone Num:800-777-2966

Emergency Phone Num:216-566-2917

CAGE:DO642

=== Contractor Identification ===

Company Name:SHERWIN-WILLIAMS CO THE SPECIALTY DIV.

Address:6830 COCHRAN RD.

Box:6709

City:SOLON

State:OH

ZIP:44139-3908

Phone:216-292-7400

CAGE:DO642

Company Name:SHERWIN-WILLIAMS DIVERSIFIED BRANDS, INC.

Address:26300 FARGO AVENUE

Box:City:BEDFORD HEIGHTS

State:OH

ZIP:44146

Country:US

Phone:216-292-7400 OR 216-595-8634

CAGE:09800

=====
Composition/Information on Ingredients
=====

Ingred Name:SOLVENT NAPHTHA, PETROLEUM, MEDIUM ALIPHATIC; (MINERAL SPIRITS 140-FLASH) VP: 0.5

CAS:64742-88-7

RTECS #:WF3450000

Fraction by Wt: 2%

Other REC Limits:NONE RECOMMENDED

OSHA PEL:N/K

ACGIH TLV:N/K

Ingred Name:ETHANE, 1,1,1-TRICHLORO-; (1,1,1-TRICHLOROETHANE) (SARA 313) (CERCLA) VP: 132.

CAS:71-55-6

RTECS #:KJ2975000

Fraction by Wt: 93%

OSHA PEL:350 PPM

ACGIH TLV:350 PPM; 450 STEL

EPA Rpt Qty:1000 LBS

DOT Rpt Qty:1000 LBS

Ozone Depleting Chemical:1

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Ingred Name:CARBON DIOXIDE VP: 760.
CAS:124-38-9
RTECS #:FF6400000
Fraction by Wt: 4%
OSHA PEL:5000 PPM
ACGIH TLV:5000 PPM; 30000 STEL

Ingred Name:VOLATILE ORGANIC COMPOUND (VOC) AS PERCENT BY WT PER BAAQMD
RULE 49: 2.6. VOC TOTAL: 0.27 LBS/GAL.
RTECS #:9999999VO
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:EFTS OF OVEREXP: THE LIVER, URINARY, CARDIOVASCULAR,
NERVOUS AND RESPIRATORY SYSTEMS. REPORTS HAVE ASSOCIATED (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5: REPEATED AND PROLONGED OVEREXPOSURE TO SOLVENTS WITH
PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE.
RTECS #:9999999ZZ

Ingred Name:WASTE DISP: INCIN. DEPRESS CONTAINER. DISPOSE OF IN
ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGS REGARDING POLLUTION.
RTECS #:9999999ZZ

Ingred Name:HDLG/STOR: DO NOT SMOKE-EXTING ALL FLAMES, PILOT LTS &
HEATERS-TURN OFF STOVES, ELEC TOOLS & APPLIANCES & ANY (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8: OTHER SOURCES OF IGNIT. CONSULT NFPA CODE. USE
APPRVD BONDING & GROUNDING PROCS. CONTENTS UNDER PRESS. DO(ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9: NOT PUNCTURE, INCIN OR EXPOSE TO TEMP >120F. HEAT
FROM SUNLIGHT, RADIATORS, STOVES, HOT WATER & OTHER (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10: HEAT SOURCES COULD CAUSE CONTAINER TO BURST. DO NOT
TAKE INTERNALLY. KEEP OUT OF REACH OF CHILDREN.
RTECS #:9999999ZZ

===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:CHLOROCARBON MATLS HAVE PRDCED SENSIT
OF MYOCARDIUM TO EPINEPHRINE IN LAB ANIMALS & COULD HAVE SIMILAR
EFT IN HUMANS. ADRENOMIMETICS (EG, EPINEPHRINE) MAY BE
CONTRAINDICATED EXCEPT FOR LIFE-SUSTAINING USES IN HUMANS
ACUTELY/CHRONICALLY EXPOSED TO CHLOROCARBONS . ACUTE: IRRIT OF
EYES, SKIN & RESP (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:HLTH HAZS: SYSTEM DEPRESS. EXTREME OVEREXP MAY
RSLT IN UNCON & POSS DEATH. HDCH, DIZZ, NAUS & LOSS OF COORD ARE
INDICATIONS OF EXCESSIVE EXPOS TO VAPS OR SPRAY MISTS. REDNESS,
ITCH OR BURNING SENSATIO N MAY INDICATE EYE OR EXCESSIVE SKIN
EXPOSURE. CHRONIC: PRLNGD OVEREXP TO SOLV INGS MAY CAUSE ADVERSE

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EFTS TO (ING 5)

Medical Cond Aggravated by Exposure:NONE GENERALLY RECOGNIZED.

=====
First Aid Measures
=====

First Aid:INGEST: NEVER GIVE ANYTHING BY MOUTH TO UNCON PERS. DO NOT INDUCE VOMIT. GIVE SEVERAL GLASSES OF WATER. SEEK MED ATTN. INHAL: REMOVE FROM EXPOSURE. RESTORE BRTHG. KEEP WARM AND QUIET. EYES: FLUSH WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES.GET MED ATTN. SKIN: WASH AFFECTED AREA THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAM CLTHG AND LAUNDRER BEFORE RE-USE.

=====
Fire Fighting Measures
=====

Flash Point:140F,60C
Extinguishing Media:CARBON DIOXIDE, DRY CHEMICAL, FOAM.
Fire Fighting Procedures:WEAR NIOSH APPRVD PRESS DEMAND SCBA & FULL PROT EQUIP . WATER SPRAY MAY BE INEFTIVE. IF WATER USED, FOG NOZZS PREFERABLE. WATER MAY BE USED TO (SUPDAT)
Unusual Fire/Explosion Hazard:THERM DECOMP PRODS MAY INCL HCL & PHOSGENE . CLSD CONTRS MAY EXPLO DUE TO BUILD-UP OF PRESS WHEN EXPOS TO EXTREME HEAT, ELEC EQUIP, SPKS & OPEN (SUPDAT)

=====
Accidental Release Measures
=====

Spill Release Procedures:REMOVE ALL SOURCES OF IGNITION. VENTILATE AND REMOVE WITH INERT ABSORBANT.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
Handling and Storage
=====

Handling and Storage Precautions:KEEP AWAY FROM HEAT, SPKS & OPEN FLAME. VAPS WILL ACCUM READILY & MAY IGNITE EXPLOSIVELY. DURING USE & UNTIL ALL VAPS ARE GONE-KEEP AREA VENT-(ING 8)
Other Precautions:INTENTIONAL MISUSE BY DELIB CONC & INHAL CONTENTS CAN BE HARMFUL/FATAL. NO SMKNG IN AREA OF USE. DO NOT USE IN GEN VICIN OF ARC WELDING, OPEN FLAMES/HOT SURFS. HEAT &/UV RADIATION MAY CAUSE FORMATION OF HCL &/PHOSGENE .

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:IF PERSONAL EXPOSURE CANNOT BE CONTROLLED BELOW APPLICABLE LIMITS BY VENTILATION, WEAR PROPERLY FITTED NIOSH APPROVED ORGANIC VAPOR OR PARTICULATE RESPIRATOR FOR PROTECTION AGAINST MATERIALS IN INGRED IENTS.
Ventilation:LOC EXHST PEF. GEN EXHST ACCEPTABLE IF EXPOS TO INGS MAINTAINED BELOW APPLIC EXPOS LIMS. REFER TO OSHA STDS (SUPDAT)
Protective Gloves:IMPERVIOUS GLOVES .
Eye Protection:ANSI APPRVD CHEM WORKERS GOGGS .
Other Protective Equipment:ANSI APPROVED EYE WASH & DELUGE SHOWER .
Work Hygienic Practices:USE ONLY WITH ADEQUATE VENTILATION. AVOID BREATHING VAP & SPRAY MIST. AVOID SKIN & EYE CONTACT. WASH HANDS AFTER USING.
Supplemental Safety and Health
FIRE FIGHT PROCS: COOL CLSD CONTRS TO PVNT PRESS BUILD-UP & POSS AUTOIGNIT/EXPLO WHEN EXPOS TO EXTREME HEAT. FIRE/EXPLO HAZS: FLAME. APPLIC TO HOT SURFS REQS SPECIAL PRECS. DURING EMER CNDTNS OVEREXP TO DECOMP PRODS MAY CAUSE HLTH HAZ. SYMPS MAY NOT BE IMMED

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APPARANT. OBTAIN MED ATTN. VENT: 1910.94, 1910.107, 1910.108.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:<0F,<-18C
Vapor Pres:SEE INGS
Vapor Density:HVR/AIR
Spec Gravity:1.30
Evaporation Rate & Reference:FASTER THAN ETHER
Appearance and Odor:NONE SPECIFIED BY MANUFACTURER.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NONE KNOWN.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:BY FIRE: CARBON DIOXIDE, CARBON
MONOXIDE, HYDROGEN CHLORIDE. HCL, PHOSGENE .

===== Disposal Considerations =====

Waste Disposal Methods:WASTE FROM THESE PRODS MAY BE HAZ AS DEFINED
UNDER RCRA 40 CFR 261. WASTE MUST BE TESTED FOR IGNITABILITY TO
DETERMINE APPLIC EPA HAZ WASTE NUMBERS. WASTE FROM SOO251 MAY ALSO
BE DEFINED AS HAZ DUE TO PRESENCE OF 1,1,1-TRICHLOROETHANE. DO NOT
(ING 7)

Disclaimer (provided with this information by the compiling agencies):
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of Defense. The United States of America in no manner whatsoever,
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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Molybdcic acid, 85% certified ACS powder (assay MoO₃ > 85%, rest is water of hydration and ammonium ions)

ACC# 15130

Section 1 - Chemical Product and Company Identification

MSDS Name: Molybdcic acid, 85% certified ACS powder (assay MoO₃ > 85%, rest is water of hydration and ammonium ions)

Catalog Numbers: A173-500

Synonyms: This reagent consists largely of ammonium molybdate. Synonyms: Ammonium heptamolybdate ((NH₄)₆Mo₇O₂₄) tetrahydrate; Ammonium paramolybdate tetrahydrate; Molybdcic acid (H₆Mo₇O₂₄), hexaammonium salt, tetrahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12054-85-2	Ammonium molybdate(VI) tetrahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white or yellow powder.

Warning! Causes eye, skin, and respiratory tract irritation. May be harmful if inhaled. May be harmful if swallowed.

Target Organs: Blood, lungs, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

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Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Molybdenum toxicity in ruminants is characterized by symptoms of copper deficiency.

Inhalation: Causes upper respiratory tract irritation. In an inhalation study, rats were administered 60 ug ammonium molybdate/ m³, 24 hours a day for 17 weeks. Changes in erythrocyte and leukocyte cell counts were observed.

Chronic: Not available. Rats were fed 25 or 50 ppm of ammonium molybdate in their food for 100 days, at which time they were killed and examined. Ammonium molybdate at 25 ppm had no effect on growth; at 50 ppm a slight decrease in the growth rate was observed. No deaths or significant effects on hemoglobin levels were observed at 25 or 50 ppm. Data from a NTP study showed that molybdenum trioxide, a water-soluble compound, is associated with an increased risk of lung tumors in mice and possibly rats.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 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

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immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe dust. Use only with adequate ventilation.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances.

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
Ammonium molybdate(VI) tetrahydrate	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).
Ammonium molybdate(VI) anhydrous	0.5 mg/m ³ TWA (respirable fraction, as Mo) (listed under Molybdenum soluble compounds).	1000 mg/m ³ IDLH (as Mo) (listed under Molybdenum soluble compounds).	5 mg/m ³ TWA (as Mo) (listed under Molybdenum soluble compounds).

OSHA Vacated PELs: Ammonium molybdate(VI) tetrahydrate: No OSHA Vacated PELs are listed for this chemical. Ammonium molybdate(VI) anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

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Physical State: Powder
Appearance: white or yellow
Odor: odorless
pH: Not available.
Vapor Pressure: Not applicable.
Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: decomposes
Freezing/Melting Point: 190 deg C
Decomposition Temperature: Not available.
Solubility: Slightly to negligible to insoluble
Specific Gravity/Density: 2.49
Molecular Formula: $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$
Molecular Weight: 1235.86

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 acids.
Hazardous Decomposition Products: Nitrogen oxides, ammonia and/or derivatives, oxides of molybdenum.
Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 12054-85-2 unlisted.

CAS# 12027-67-7: QA5076000

LD50/LC50:

Not available.

Not available.

Oral median lethal dose for daily repeated doses was found to be 333 mg Mo/kg/day (up to 232 days) for ammonium molybdate. This is not an acute oral LD50 value, which is a dose administered once.

Carcinogenicity:

CAS# 12054-85-2:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 12027-67-7:

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- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans (listed as 'Molybdenum soluble compounds').
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

Epidemiology: No epidemiological studies or case reports investigating the association of exposure to ammonium molybdate and cancer risk in humans were identified in the available literature.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Positive in micronucleus assay in human lymphocytes. Induced chromosome aberrations and sister-chromatid exchanges in human lymphocytes. Positive in E. coli strains WP2 and WP2uvra without activation. Positive in B. subtilis strains H17 and M45.

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

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US FEDERAL

TSCA

CAS# 12054-85-2 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 12027-67-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 12054-85-2: immediate, delayed.

CAS # 12027-67-7: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12054-85-2 can be found on the following state right to know lists: California, (listed as Molybdenum compounds, n.o.s.), Minnesota, (listed as Molybdenum soluble compounds).

CAS# 12027-67-7 can be found on the following state right to know lists: Minnesota, (listed as Molybdenum soluble compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 22 Do not breathe dust.

S 24/25 Avoid contact with skin and eyes.

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WGK (Water Danger/Protection)

CAS# 12054-85-2: 1

CAS# 12027-67-7: 1

Canada - DSL/NDSL

CAS# 12027-67-7 is listed on Canada's DSL List.

Canada - WHMIS

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# 12054-85-2 (listed as Molybdenum compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

CAS# 12027-67-7 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997

Revision #10 Date: 9/26/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Nickel(II) chloride hexahydrate

ACC# 16310

Section 1 - Chemical Product and Company Identification

MSDS Name: Nickel(II) chloride hexahydrate

Catalog Numbers: AC193570000, AC193570050, AC193570250, AC207670000, AC207670020, AC207670250, AC207675000, AC270510000, AC270510010, AC270512500, S80104, S801041, N53-500, N54-10, N54-250, N54-3, N54-500, N54ME

Synonyms: Nickelous chloride; Nickel 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
7791-20-0	Nickel(II) chloride hexahydrate	96+	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine crystals.

Warning! Toxic if swallowed. May cause skin sensitization by skin contact. Cancer hazard. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Target Organs: Skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May be harmful if absorbed through the skin.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Toxic if swallowed.

Inhalation: May cause allergic respiratory reaction. Inhalation may be fatal as a result of spasm,

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inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. May cause burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause respiratory tract cancer. May cause cancer in humans. Symptoms of overexposure to nickel can cause sensitization, dermatitis, allergic asthma and pneumonitis.

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: 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. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Noncombustible.

Autoignition Temperature: Noncombustible.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Isolate area and deny entry. 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
Nickel(II) chloride hexahydrate	none listed	0.015 mg/m ³ TWA (as Ni, except Nickel carbonyl) (listed under Nickel compounds). 10 mg/m ³ IDLH (as Ni, except Nickel carbonyl) (listed under Nickel compounds).	1 mg/m ³ TWA (as Ni) (listed under Nickel soluble compounds).
Nickel(II) chloride	0.1 mg/m ³ TWA (inhalable fraction, as Ni) (listed under Nickel, inorganic compounds, soluble).	none listed	none listed

OSHA Vacated PELs: Nickel(II) chloride hexahydrate: No OSHA Vacated PELs are listed for this chemical. Nickel(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 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: green - fine

Odor: odorless

Material Safety Data Sheets, Carver Hall RM 208-A

pH: 4-6 (5% aq. soln.)

Vapor Pressure: 1 mm Hg @615.6 deg C

Vapor Density: Not available.

Evaporation Rate: Negligible

Viscosity: Not available.

Boiling Point: 972.8 deg C

Freezing/Melting Point: Not available.

Decomposition Temperature: > 140 deg C

Solubility: 2540 g/L @ 20°C

Specific Gravity/Density: 3.55 (water=1)

Molecular Formula: NiCl₂·6H₂O

Molecular Weight: 237.71

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Strong acids, peroxides, potassium.

Hazardous Decomposition Products: Hydrogen chloride, chlorine, nickel oxide, toxic and highly flammable nickel carbonyl, nickel.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7791-20-0: QR6480000

CAS# 7718-54-9: QR6475000

LD50/LC50:

CAS# 7791-20-0:

Oral, rat: LD50 = 105 mg/kg;

CAS# 7718-54-9:

Oral, mouse: LD50 = 369 mg/kg;

Oral, rat: LD50 = 681 mg/kg;

Oral, rat: LD50 = 105 mg/kg;

Carcinogenicity:

CAS# 7791-20-0:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/7/04 (listed as Nickel compounds).
- **NTP:** Known carcinogen (listed as Nickel compounds).
- **IARC:** Group 1 carcinogen

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CAS# 7718-54-9:

- **ACGIH:** Not listed.
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Group 1 carcinogen

Epidemiology: Epidemiological studies have shown an increased incidence of cancers among nickel refinery workers. An increased incidence of lung and nasal cavity cancers has been noted among women in nickel smelters and refineries.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Cytogenetic Analysis: mouse mammary gland 800umol/L. Sister Chromatid Exchange: hamster fibroblast 32mg/L.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: 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, INORGANIC, N.O.S.	TOXIC SOLID INORGANIC NOS (NICKEL CHLORIDE HEXAHYDRATE)
Hazard Class:	6.1	6.1
UN Number:	UN3288	UN3288
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7791-20-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7718-54-9 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# 7718-54-9: 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 # 7791-20-0: immediate, delayed.

Section 313

This material contains Nickel(II) chloride hexahydrate (listed as Nickel compounds), 96+%, (CAS# 7791-20-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7791-20-0 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7718-54-9 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7791-20-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7791-20-0 can be found on the following state right to know lists: California, (listed as Nickel compounds), New Jersey, (listed as Nickel compounds), Pennsylvania, (listed as Nickel compounds), Minnesota, (listed as Nickel soluble compounds).

CAS# 7718-54-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Nickel(II) chloride hexahydrate, listed as 'Nickel compounds', a chemical known to the state of California to cause cancer.

Material Safety Data Sheets, Carver Hall RM 208-A

California No 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 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 24 Avoid contact with skin.

S 29 Do not empty into drains.

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 53 Avoid exposure - obtain special instructions before use.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7791-20-0: No information available.

CAS# 7718-54-9: 2

Canada - DSL/NDSL

CAS# 7718-54-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7791-20-0 (listed as Nickel soluble compounds) is listed on the Canadian Ingredient Disclosure List.

CAS# 7718-54-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997

Revision #8 Date: 11/06/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet
Nickel(II) acetate tetrahydrate

ACC# 16260

Section 1 - Chemical Product and Company Identification

MSDS Name: Nickel(II) acetate tetrahydrate

Catalog Numbers: N46-500

Synonyms: Acetic acid, nickel salt tetrahydrate; Nickel acetate 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
6018-89-9	Nickel(II) acetate tetrahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: green solid.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause allergic skin reaction. Potential cancer hazard. May cause cancer based on animal studies.

Target Organs: Respiratory system, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May cause dermatitis. Causes "nickel itch" which is a dermatitis resulting from sensitization to nickel, which is characterized by skin eruptions, followed by discrete ulcers that may discharge and become crusted, or by eczema.

Ingestion: Harmful if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: Causes respiratory tract irritation. May cause allergic respiratory reaction. In rare instances, exposure may cause sensitization, resulting in inflammation of the mucous membranes and in eczematous

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eruptions.

Chronic: May cause respiratory tract cancer. May cause cancer according to animal studies. Symptoms of overexposure to nickel can cause sensitization, dermatitis, allergic asthma and pneumonitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

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. 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.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. 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
Nickel(II) acetate tetrahydrate	none listed	0.015 mg/m ³ TWA (as Ni, except Nickel carbonyl) (listed under Nickel compounds). 10 mg/m ³ IDLH (as Ni, except Nickel carbonyl) (listed under Nickel compounds).	1 mg/m ³ TWA (as Ni) (listed under Nickel soluble compounds).

OSHA Vacated PELs: Nickel(II) 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: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: green

Odor: acetic odor - weak odor

pH: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Freezing/Melting Point:250 deg C
Decomposition Temperature:Not available.
Solubility: 27% @ 0°C
Specific Gravity/Density:1.744
Molecular Formula:NiC₄H₆O₄.4H₂O
Molecular Weight:248.7832

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, irritating and toxic gases, carbon dioxide, nickel oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 6018-89-9: QR6126000
LD50/LC50:
CAS# 6018-89-9:
Oral, mouse: LD50 = 410 mg/kg;
Oral, rat: LD50 = 350 mg/kg;

Carcinogenicity:
CAS# 6018-89-9:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/7/04 (listed as Nickel compounds).
- **NTP:** Known carcinogen (listed as Nickel compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: An increased incidence of lung and nasal cavity cancers has been noted among women in nickel smelters and refineries. Epidemiological studies have shown an increased incidence of cancers among nickel refinery workers. IARC Group 2B: Proven animal carcinogenic substance of potential relevance to humans. IARC Group 2B: No data available on human carcinogenicity, however sufficient evidence of carcinogenicity in animals.

Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6018-89-9 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

Material Safety Data Sheets, Carver Hall RM 208-A

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 # 6018-89-9: immediate, delayed.

Section 313

This material contains Nickel(II) acetate tetrahydrate (listed as Nickel compounds), 100%, (CAS# 6018-89-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 6018-89-9 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 6018-89-9 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# 6018-89-9 can be found on the following state right to know lists: California, (listed as Nickel compounds), New Jersey, (listed as Nickel compounds), Pennsylvania, (listed as Nickel compounds), Minnesota, (listed as Nickel soluble compounds).

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Nickel(II) acetate tetrahydrate, listed as 'Nickel compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 40 Limited evidence of a carcinogenic effect.

R 43 May cause sensitization by skin contact.

Safety Phrases:

S 22 Do not breathe dust.

WGK (Water Danger/Protection)

CAS# 6018-89-9: No information available.

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Material Safety Data Sheets, Carver Hall RM 208-A

Canadian Ingredient Disclosure List

CAS# 6018-89-9 (listed as Nickel soluble compounds) is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 12/17/1997

Revision #6 Date: 11/08/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- NICKEL NITRATE, HEXAHYDRATE, N62 -- 6810-00N072885

=====
Product Identification
=====

Product ID:NICKEL NITRATE, HEXAHYDRATE, N62

MSDS Date:07/14/1993

FSC:6810

NIIN:00N072885

MSDS Number: CDWTV

=== 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: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:NICKEL NITRATE, HEXAHYDRATE

CAS:13478-00-7

RTECS #:QR7300000

Fraction by Wt: 100%

OSHA PEL:0.1 MG/M3 (MFR)

ACGIH TLV:0.1 MG/M3 (MFR)

Ingred Name:SUPDAT:MONITOR NOZZLES; IF IMPOSSIBLE, WITHDRAW FROM AREA &
LET FIRE BURN. EVACUATE TO A RADIUS OF 2500 FEET (ING 3)

RTECS #:9999999ZZ

Ingred Name:ING 2:FOR UNCONTROLLABLE FIRES.

RTECS #:9999999ZZ

Ingred Name:EFTS OF OVEREXP:SYSTEMIC EFTS MAY INCL GIDD, HYPERGLYCEMIA,
CAPILLARY DMG, ESP IN BRAIN & ADRENALS, RENAL INJURY, (ING 5)

RTECS #:9999999ZZ

Ingred Name:ING 4:& CNS DEPRESS. CHRONIC:INHAL:RPTD/PRLNG EXPOS MAY
CAUSE CHRONIC PULM IRRIT. HYPERTROPHIC RHINITIS, NASAL (ING 6)

RTECS #:9999999ZZ

Ingred Name:ING 5:SINUSITIS, POLYPOSIS/SEPTAL PERFORATION, ANOSMIA &
INCR SUSCEPTIBILITY TO PULM INFECTIONS. INCR INCIDENCE (ING 7)

RTECS #:9999999ZZ

Ingred Name:ING 6:OF LUNG & NASAL CANCER HAS BEEN REPORTED IN WORKERS
IN NICKEL REFINING INDUSTRY. SKIN:MAY CAUSES SENSIT (ING 8)

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RTECS #:9999999ZZ

Ingred Name:ING 7:DERM. EYES:MAY CAUSE CONJ. INGEST:ANIMAL STUDIES
INDICATE THAT PRLNG INGEST OF SOME SOLUBLE NICKEL CMPDS (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8:MAY AFFECT BLOOD, BONE MARROW, THYMUS, SPLEEN,
KIDNEYS & IMMUNE SYS. RPTD/PRLNG EXPOS TO NITRATES MAY (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9:CAUSE ANEMIA, NEPHIRITIS & POSSIBLY
METHEMOGLOBINEMIA.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC:REMAINS(FOR AT LST 15 MINS). GET MED ATTN
IMMED. INGEST:DILUTE POIS IMMED W/LG AMTS OF WATER/MILK(ING 12)
RTECS #:9999999ZZ

Ingred Name:ING 11:& REMOVE BY GASTRIC LAVAGE UNLESS VICTIM IS ALREADY
VOMIT. GET MED ATTN IMMED. ADMIN OF GASTRIC LAVAGE (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 12:SHOULD BE PERFORMED BY QUALIFIED MED PERS. NO
SPECIFIC ANTIDOTE.
RTECS #:9999999ZZ

Ingred Name:RESP PROT:SUPPLIED-AIR RESP W/FULL FACEPIECE & OPERATED IN
PRESS-DEMAND/OTHER POS PRESS MODE IN COMBINATION W/ (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14:AUXILIARY SCBA OPERATED IN PRESS-DEMAND/OTHER POS
PRESS MODE. ESCAPE-ANY AIR-PURIFYING FULL FACEPIECE (ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15:RESP (GAS MASK) W/CHIN-STYLE, FRONT- OR BACK-MOUNTED
CANISTER PROVIDING PROT AGAINST NICKEL & COMPOUNDS; (ING 17)
RTECS #:9999999ZZ

Ingred Name:ING 16:ANY APPROPRIATE ESCAPE-TYPE SCBA.
RTECS #:9999999ZZ

=====
===== Hazards Identification =====

LD50 LC50 Mixture:LD50:(ORAL,RAT) 1620 MG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO
Health Hazards Acute and Chronic:ACUTE:INHAL:MAY CAUSE IRRIT TO MUC
MEMBS OF UPPER RESP TRACT, COUGH, SORE THROAT & SHORTNESS OF
BREATH. ASTHMA MAY OCCUR. SKIN CONT:MAY CAUSE IRRIT. "NICKEL ITCH"
MAY BEGIN W/SENSATION OF BURNING & IT CH AT PLACE OF CONT & MAY
LAST 7 DAYS BEFORE CHARACT SKIN ERUPTIONS APPEAR. PRIMARY SKIN
ERUPTION IS (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NICKEL CMPDS:IARC MONO ON EVAL OF CARCIN
RISK OF CHEMS TO MAN, VOL 49, PG 257, 1990:GRP 2B. NTP 7TH ANNUAL
RPT (SUPDAT)
Effects of Overexposure:HLTH HAZ:ERYTHEMATOUS/FOLLICULAR, FOLLOWED BY
SUPERFICIAL ULCERS WHICH DISCHARGE & BECOME CRUSTED. SENSIT IN
PREVIOUSLY EXPOS INDIVIDUALS MAY OCCUR. EYE CONT:DUST MAY BE IRRIT

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TO CONJ. SOLNS ARE SLIGHTLY CORR & MAY CAUSE MORE SERIOUS
EFFECTS. INGEST: LG DOSES OF NICKEL SALTS MAY CAUSE GI IRRIT, NAUSEA,
VOMIT & DIARR. (ING 4)

Medical Condition Aggravated by Exposure: PERSONS WITH HISTORY OF ASTHMA,
ALLERGIES, IMPAIRED PULMONARY FUNCTION OR KNOWN SENSITIZATION TO
NICKEL ARE AT INCREASED RISK FROM EXPOSURE.

===== First Aid Measures =====

First Aid: INHAL: REMOVE TO FRESH AIR IMMEDIATELY. IF BREATHING STOPPED, PERFORM
ARTIFICIAL RESPIRATION. KEEP WARM & AT REST. TREAT SYMPTOMATICALLY &
SUPPORTIVELY. GET MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING & SHOES IMMEDIATELY.
WASH AFFECTED AREAS WITH SOAP & WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS
(APPROX 15-20 MINUTES). GET MEDICAL ATTENTION. EYES: WASH IMMEDIATELY WITH LARGE AMOUNTS OF
WATER/NORMAL SALINE, OCCASIONALLY LIFTING UPPER & LOWER LIDS, UNTIL NO
EVIDENCE OF CHEMICAL (ING 11)

===== Fire Fighting Measures =====

Extinguishing Media: WATER ONLY, NO DRY CHEMICAL, CARBON DIOXIDE OR
HALON. FOR LARGER FIRES, FLOOD AREA WITH WATER FROM A DISTANCE.
Fire Fighting Procedures: USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT. MOVE
CONTAINERS FROM AREA IF WITHOUT RISK. APPLY COOLING WATER TO SIDES OF
CONTAINERS EXPOSED UNTIL WELL AFTER FIRE IS SUPPRESSED
Unusual Fire/Explosion Hazard: NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO
HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures: KEEP COMBUSTIBLES AWAY FROM SPILLED MATERIAL. DO NOT
TOUCH MATERIAL. SMALL DRY SPILLS: WITH CLEAN SHOVEL PLACE MATERIAL INTO CLEAN, DRY
CONTAINER & COVER; MOVE CONTAINERS FROM SPILL AREA. SMALL LIQUID SPILLS: TAKE UP
WITH SAND, EARTH/OTHER ABSORBENT MATERIAL & PLACE INTO CONTAINERS FOR LATER
(SUPPLEMENTARY DATA)
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions: OBSERVE ALL FEDERAL, STATE & LOCAL REGULATIONS WHEN
STORING SUBSTANCE. STORE AWAY FROM INCOMPATIBLE SUBSTANCES. PROTECT
AGAINST PHYSICAL DAMAGE. STORE IN A COOL, DRY PLACE.
Other Precautions: AVOID STORAGE ON WOOD FLOORS. SEPARATE FROM
COMBUSTIBLE, ORGANIC OR OTHER READILY OXIDIZABLE MATERIALS. IMMEDIATELY
REMOVE & DISPOSE OF ANY SPILLED NITRATE. CONSULT NFPA PUBLICATION
43A, STORAGE OF LIQUID & SOLID OXIDIZING MATERIALS FOR STORAGE REQUIREMENTS.

===== Exposure Controls/Personal Protection =====

Respiratory Protection: SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINANT
LEVELS FOUND IN WORK PLACE, MUST NOT EXCEED WORKING LIMITS OF RESPIRATOR &
BE NIOSH APPROVED: AT ANY DETECTABLE CONCENTRATION: ANY SCBA WITH FULL FACEPIECE &
OPERATED IN PRESSURE-DEMAND/OTHER POSITIVE PRESSURE MODE; ANY (ING 14)
Ventilation: PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO
MEET PERMITS.
Protective Gloves: IMPERMEABLE GLOVES .
Eye Protection: ANSI APPROVED CHEMICAL WORKERS GOGGLES & (SUPPLEMENTARY DATA)
Other Protective Equipment: ANSI APPROVED EYE WASH FOUNTAIN & DELUGE
SHOWER . APPROPRIATE PROTECTIVE (IMPERMEABLE) CLOTHING & EQUIPMENT TO PREVENT CONTACT

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W/SUBSTANCE.

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

PH:4 (AQ SOLN). EXPLAN OF CARCIN:ON CARCINS, 1994:ANTIC TO BE CARCIN.
ANIMAL:LUNGS, NASAL CAVITIES. SPILL PROC:DISP. LGR SPILLS:DIKE FAR
AHEAD OF SPILL FOR LATER DISP. ISOLATE HAZ AREA & DENY ENTRY. E YE
PROT:FULL LGTH FSHLD . FIRE FIGHT PROC:OUT. FOR MASSIVE FIRES IN
CARGO AREA, USE UNMANNED HOSE HOLDER/ (ING 2)

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:278F,137C
Melt/Freeze Pt:M.P/F.P Text:135F,57C
Vapor Pres:0 @ 20C
Spec Gravity:2.05
pH:SUPDAT
Solubility in Water:238.5% @ 0C
Appearance and Odor:BRIGHT GREEN DELIQUESCENT CRYSTALS; ODORLESS.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
ALUMINUM, COMBUSTIBLE MATL, ESTERS, ORGANIC MATLS, SULFUR. FOR A
COMPLETE LIST OF MATLS TO AVOID CONTACT NEHC .
Stability Condition to Avoid:AVOID CONT W/COMBUST MATLS (WOOD, PAPER,
FUEL, OILS, ETC); IGNIT/EXPLO MAY RSLT. AVOID CONTAM OF WATER
SOURCES.
Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS MAY
INCLUDE TOXIC OXIDES OF NITROGEN & NICKEL.

===== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE & LOCAL REGULATIONS
WHEN DISPOSING OF THIS SUBSTANCE. DISPOSAL MUST BE I/A/W STDS
APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262. EPA HAZ
WASTE NUMBER D001. RQ:100 LBS.

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particular situation.

Material Safety Data Sheet

Nickel, Powder, -325 mesh

ACC# 96306

Section 1 - Chemical Product and Company Identification

MSDS Name: Nickel, Powder, -325 mesh

Catalog Numbers: AC193610000, AC193610250, AC193611000

Synonyms: Raney alloy

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-02-0	Nickel	>98	231-111-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown-gray powder.

Warning! Flammable solid. May cause allergic skin reaction. Cancer hazard. May cause eye irritation. May cause respiratory tract irritation. May cause cancer in humans. May cause central nervous system effects.

Target Organs: Central nervous system, respiratory system.

Potential Health Effects

Eye: May cause eye irritation. Causes redness and pain. May cause chemical conjunctivitis and corneal damage.

Skin: May cause severe irritation and possible burns. Causes "nickel itch" which is a dermatitis resulting from sensitization to nickel, which is characterized by skin eruptions, followed by discrete ulcers that may discharge and become crusted, or by eczema. May cause sensitization by skin contact.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause tremors and convulsions. Ingestion of large amounts may cause gastroenteritis.

Inhalation: May cause respiratory tract irritation. May cause asthmatic attacks due to allergic sensitization of the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle

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pain and increased white blood cell count. May cause anosmia (loss of smell). May be harmful if inhaled. **Chronic:** Prolonged or repeated eye contact may cause conjunctivitis. Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause respiratory tract cancer. May cause kidney injury. Chronic inhalation can cause pneumoconiosis. Repeated inhalation may cause perforation of the nasal septum. Symptoms of overexposure to nickel can cause sensitization, dermatitis, allergic asthma and pneumonitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Antidote: There exists several chelation agents. The determination of their use should be made 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. Dust can be an explosion hazard when exposed to heat or flame. Flammable solid. May burn rapidly with flare burning effect. May re-ignite after fire is extinguished. May be pyrophoric.

Extinguishing Media: Do NOT use water, carbon dioxide, or foam. Confining and smothering is preferable to applying water. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. Use DRY sand, sodium chloride powder, graphite powder, copper powder or Lith-X powder. Dousing metallic fires with water may generate hydrogen gas, an extremely dangerous explosion hazard, particularly if fire is in a confined environment.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 4; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

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Spills/Leaks: Reduce airborne dust and prevent scattering by moistening with water. Sweep up, then place into a suitable container for disposal. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Carefully scoop up and place into appropriate disposal container. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Nickel	1.5 mg/m ³ TWA (inhalable fraction)	0.015 mg/m ³ TWA 10 mg/m ³ IDLH	1 mg/m ³ TWA

OSHA Vacated PELs: Nickel: 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 gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: brown-gray

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Odor: odorless

pH: Not available.

Vapor Pressure: 1 mm Hg @ 1810 C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not applicable.

Boiling Point: 2730 deg C

Freezing/Melting Point: 1455 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble in water.

Specific Gravity/Density: 8.90

Molecular Formula: Ni

Molecular Weight: 58.69

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, dust generation, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, hydrochloric acid, nitric acid, sulfuric acid, sulfur, selenium, nitrates, halogens, interhalogens, nitriles (e.g. acetonitrile, methyl cyanide), organic solvents, fluorine, ammonia, hydrazine, phosphorus, ammonium nitrate.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, nickel oxide, toxic and highly flammable nickel carbonyl.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-02-0: QR5950000; QR6126100; QR6555000; QR7120000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7440-02-0:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 10/1/89
- **NTP:** Suspect carcinogen
- **IARC:** Group 1 carcinogen (listed as Nickel compounds).

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Mutagenicity: No data available.

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Neurotoxicity: No data available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information reported.

Physical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	METAL POWDERS, FLAMMABLE, N.O.S.	METAL POWDER FLAMMABLE NOS (NICKEL)
Hazard Class:	4.1	4.1
UN Number:	UN3089	UN3089
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-02-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

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None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7440-02-0: 100 lb final RQ (no reporting of releases of this hazardous substance is required)

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-02-0: immediate, delayed, fire.

Section 313

This material contains Nickel (CAS# 7440-02-0, >98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7440-02-0 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 7440-02-0 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7440-02-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-02-0 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 Nickel, 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 40 Limited evidence of a carcinogenic effect.

R 43 May cause sensitization by skin contact.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 22 Do not breathe dust.

S 36 Wear suitable protective clothing.

WGK (Water Danger/Protection)

CAS# 7440-02-0: No information available.

Canada - DSL/NDSL

CAS# 7440-02-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, 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.

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Canadian Ingredient Disclosure List

CAS# 7440-02-0 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 3/19/1998

Revision #7 Date: 9/26/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet
Nickel(II) sulfate heptahydrate

ACC# 11475

Section 1 - Chemical Product and Company Identification

MSDS Name: Nickel(II) sulfate heptahydrate

Catalog Numbers: AC270550000, AC270550010, AC270552500

Synonyms: Sulfuric acid, nickel(2+)salt(1:1), heptahydrate; Nickelous sulfate heptahydrate; Nickel(2+)Sulfate Heptahydrate; Nickel Monosulfate Hexahydrate

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
10101-98-1	Nickel(II) sulfate heptahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: blue-green crystals.

Warning! Harmful if swallowed. May cause allergic respiratory and skin reaction. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause eye, skin, and respiratory tract irritation. Cancer hazard. May cause sensitization by inhalation and by skin contact.

Target Organs: Respiratory system, gastrointestinal system, skin.

Potential Health Effects

Eye: Causes mild eye irritation.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract.

Inhalation: May cause severe allergic respiratory reaction. May be harmful if inhaled. May cause respiratory sensitization.

Chronic: Limited evidence of a carcinogenic effect.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid 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 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. Containers may explode when heated.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical 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: 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: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Do not ingest or inhale. Use only in a chemical fume hood.

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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 general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Nickel(II) sulfate heptahydrate	none listed	0.015 mg/m ³ TWA (as Ni, except Nickel carbonyl) (listed under Nickel compounds). 10 mg/m ³ IDLH (as Ni, except Nickel carbonyl) (listed under Nickel compounds).	1 mg/m ³ TWA (as Ni) (listed under Nickel soluble compounds).

OSHA Vacated PELs: Nickel(II) sulfate heptahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: blue-green

Odor: None reported.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 9.69

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: 1.948

Material Safety Data Sheets, Carver Hall RM 208-A

Molecular Formula: NiO₄S₇H₂O

Molecular Weight: 280.88

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Oxides of sulfur, nickel oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10101-98-1: WT1157000

LD50/LC50:

Not available.

Oral: Rat, LD50 = 264

Carcinogenicity:

CAS# 10101-98-1:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/7/04 (listed as Nickel compounds).
- **NTP:** Known carcinogen (listed as Nickel compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: Epidemiological studies have shown an increased incidence of cancers among nickel refinery workers.

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. Harmful to aquatic life in very low concentrations.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	No information available.
Hazard Class:	XCP	
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10101-98-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Nickel(II) sulfate heptahydrate (listed as Nickel compounds), 100%, (CAS# 10101-98-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

Material Safety Data Sheets, Carver Hall RM 208-A

CAS# 10101-98-1 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 10101-98-1 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10101-98-1 can be found on the following state right to know lists: California, (listed as Nickel compounds), New Jersey, (listed as Nickel compounds), Pennsylvania, (listed as Nickel compounds), Minnesota, (listed as Nickel soluble compounds).

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Nickel(II) sulfate heptahydrate, listed as 'Nickel compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN N

Risk Phrases:

R 22 Harmful if swallowed.

R 40 Limited evidence of a carcinogenic effect.

R 42/43 May cause sensitization by inhalation and skin contact.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 28A After contact with skin, wash immediately with plenty of water.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 10101-98-1: 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 D1B, D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheets, Carver Hall RM 208-A

CAS# 10101-98-1 (listed as Nickel soluble compounds) is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/11/1998

Revision #5 Date: 6/20/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC, CHEMICAL DIV. -- NICKEL (11)CHLORIDE HEXAHYDRATE -- 6810-00-201-1802

=====
Product Identification
=====

Product ID:NICKEL (11)CHLORIDE HEXAHYDRATE
MSDS Date:10/13/1989
FSC:6810
NIIN:00-201-1802
MSDS Number: BHPBP
=== 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:NICKELOUS CHLORIDE HEXAHYDRATE
CAS:7791-20-0
RTECS #:QR6480000
Fraction by Wt: 100.0%
OSHA PEL:0.1 MG/M3 (AS NI)
ACGIH TLV:0.1 MG/M3 (AS NI)

=====
Hazards Identification
=====

LD50 LC50 Mixture:105MG/KG ORAL-RAT
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:NO
Health Hazards Acute and Chronic:ACUTE: INHALE: IRRITATION, COUGH,
PNEUMONITIS AND FEVER. SKIN: SWELLING AND IRRITATION, SENSITIZATION.
EYE: REDNESS AND IRRITATION. INGEST: NAUSEA, VOMITING, STOMATITIS,
DIARRHEA. CHRONIC: INHALE: PULM ONARY EDEMA, MUCOUS MEMBRANE
IRRITATION, AND PULMONARY SENSITIZATION. SKIN: SENSITIZATION
DERMATITIS.
Explanation of Carcinogenicity:DATA PER MGF MSDS.(FOR NICKEL)
Effects of Overexposure:CONTACT WITH NICKEL COMPOUNDS CAUSES "NICKEL
ITCH", A FORM OF SENSITIZATION WITH ITCHING, BURNING, ECZEMA.
INHALATION OF NICKEL SALTS IRRITATES THE RESPIRATORY TRACT, CAUSING
PNEUMONITIS AND FEVER. IN GESTION CAUSES VOMITING AND COLLAPSE.
OTHER SYMPTOMS ARE WATERY ARE BLOODY DIARRHEA, HEMOLYSIS, JAUNDICE,
CONVULSIONS.
Medical Cond Aggravated by Exposure:PERSONS WITH A HISTORY OF SKIN AND

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RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.

===== First Aid Measures =====

First Aid:INHALATION: REMOVE SUBJECT TO FRESH AIR. MAINTAIN BREATHING, KEEP WARM AND GET MEDICAL HELP. EYE: FLUSH WITH PLENTY OF WATER FOR 15 MINUTES. GET IMMEDIATE MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING AND SHOES. WASH WITH SOAP AND WATER. INGESTION: GIVE 2-4 GLASSES OF WATER AND INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION.

===== Fire Fighting Measures =====

Flash Point:NON-FLAMMABLE
Extinguishing Media:USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
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:NEGLIGIBLE FIRE AND NEGLIGIBLE HAZARD IN DUST FORM WHEN EXPOSED TO HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures:SWEEP UP AND PLACE IN SUITABLE (FIBERBOARD), CONTAINERS FOR LATER DISPOSAL.

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN COOL, DRY, WELL VENTILATED AREA. PROTECT FROM PHYSICAL DAMAGE. KEEP CONTAINERS CLOSED.
Other Precautions:AVOID BREATHING DUST; AVOID CONTACT WITH EYES, SKIN, AND CLOTHING.

===== 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.
Ventilation:PROVIDE LOCAL EXHAUST VENTILATION OR GENERAL DILUTION VENTILATION TO MEET PERMISSIBLE EXPOSURE LIMITS.
Protective Gloves:RUBBER
Eye Protection:CHEMICAL SAFETY GOGGLES AND FACESHIELD
Other Protective Equipment:SAFETY SHOWER AND EYE BATH. OTHER EQUIPMENT AS REQUIRED TO MINIMIZE EXPOSURE FROM PROLONGED OR REPEATED CONTACT.
Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Safety and Health

===== Physical/Chemical Properties =====

HCC:T4
NRC/State Lic Num:NOT RELEVANT
Spec Gravity:3.6
pH:@ 4
Solubility in Water:SOLUBLE

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Appearance and Odor:GREEN DELIQUESCENT CRYSTALS OR MONOCLINIC
CRYSTALLINE POWDER

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

POTASSIUM;FORMS SHOCK-SENSITIVE MIXTURE

Stability Condition to Avoid:ABNORMAL TEMPERATURES AND PRESSURES.FLAMES

Hazardous Decomposition Products:MAY FORM TOXIC AND HIGHLY FLAMMABLE
NICKEL CARBONYL UNDER THERMAL DECOMPOSITION.

===== Disposal Considerations =====

Waste Disposal Methods:CONSULT LOCAL AUTHORITIES;DISPOSAL MUST BE IN
ACCORDANCE WITH LOCAL,STATE AND FEDERAL REGULATIONS

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Nickel(II) nitrate hexahydrate

ACC# 16370

Section 1 - Chemical Product and Company Identification

MSDS Name: Nickel(II) nitrate hexahydrate

Catalog Numbers: AC223150000, AC223150050, AC223155000, S801051, S93311, S93312, N62-500

Synonyms: Nickelous nitrate hexahydrate; Nitric acid, nickel(2+) salt, hexahydrate; Nickel dinitrate hexahydrate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
13478-00-7	Nickel dinitrate hexahydrate	99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: emerald green solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. May cause allergic respiratory and skin reaction. May cause severe eye irritation and possible injury. May cause harm to the unborn child. Causes skin and respiratory tract irritation. May be harmful if swallowed or inhaled. May cause cancer by inhalation.

Target Organs: Blood, central nervous system, eyes, skin, mucous membranes.

Potential Health Effects

Eye: May cause severe eye irritation and possible injury.

Skin: Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and

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kidney damage.

Inhalation: Dust is irritating to the respiratory tract. May cause allergic respiratory reaction. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death.

Chronic: Prolonged inhalation may cause respiratory tract inflammation and lung damage. Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause respiratory tract cancer. Possible risk of harm to the unborn child.

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 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. 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. 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 if exposed to fire.

Extinguishing Media: Use water spray to cool fire-exposed containers. Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. For large fires flood fire with water from a distance. Do NOT use dry chemicals, CO₂, Halon or foams.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 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: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing

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apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Avoid generating dusty conditions. Remove all sources of ignition. Carefully scoop up and place into appropriate disposal container. 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. Wash clothing before reuse. Do not breathe dust or fumes. Use only with adequate ventilation.

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 reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Nickel dinitrate hexahydrate	0.1 mg/m ³ TWA (inhalable fraction, as Ni) (listed under Nickel, inorganic compounds, soluble).	0.015 mg/m ³ TWA (as Ni, excluding Nickel carbonyl) (listed under Nickel compounds). 10 mg/m ³ IDLH (as Ni except Nickel carbonyl) (listed under Nickel compounds).	1 mg/m ³ TWA (as Ni) (listed under Nickel soluble compounds).
Nickel dinitrate anhydrous	0.1 mg/m ³ TWA (inhalable fraction, as Ni) (listed under Nickel, inorganic compounds, soluble).	0.015 mg/m ³ TWA (as Ni, excluding Nickel carbonyl) (listed under Nickel compounds). 10 mg/m ³ IDLH (as Ni except Nickel carbonyl) (listed under Nickel compounds).	1 mg/m ³ TWA (as Ni) (listed under Nickel soluble compounds).

OSHA Vacated PELs: Nickel dinitrate hexahydrate: No OSHA Vacated PELs are listed for this chemical. Nickel dinitrate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: emerald green
Odor: odorless
pH: 4.0 (aqueous sol.)
Vapor Pressure: Negligible
Vapor Density: 10.0
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 137 deg C
Freezing/Melting Point: 56.7 deg C
Decomposition Temperature: 200 deg C
Solubility: Soluble.
Specific Gravity/Density: 2.05
Molecular Formula: Ni(NO₃)₂·6H₂O
Molecular Weight: 290.8

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong reducing agents, combustible materials, flammable liquids.
Hazardous Decomposition Products: Nitrogen oxides, irritating and toxic fumes and gases, nickel oxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 13478-00-7: QR7300000
CAS# 13138-45-9: QR7200000
LD50/LC50:
CAS# 13478-00-7:
Oral, rat: LD50 = 1620 mg/kg;
.
CAS# 13138-45-9:
.

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Carcinogenicity:

CAS# 13478-00-7:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/7/04 (listed as Nickel compounds).
- **NTP:** Known carcinogen (listed as Nickel compounds).
- **IARC:** Group 1 carcinogen

CAS# 13138-45-9:

- **ACGIH:** Not listed.
- **California:** carcinogen, initial date 5/7/04 (listed as Nickel compounds).
- **NTP:** Known carcinogen (listed as Nickel compounds).
- **IARC:** Group 1 carcinogen (listed as Nickel compounds).

Epidemiology: An increased incidence of lung and nasal cavity cancers has been noted among women in nickel smelters and refineries.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: 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:	NICKEL NITRATE	NICKEL NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN2725	UN2725

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Packing Group:	III	III
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Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 13478-00-7 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# 13138-45-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 13478-00-7: immediate, delayed, fire.

Section 313

This material contains Nickel dinitrate hexahydrate (listed as Nickel compounds), 99%, (CAS# 13478-00-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Nickel dinitrate anhydrous (listed as Nickel compounds), -%, (CAS# 13138-45-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 13478-00-7 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

CAS# 13138-45-9 (listed as Nickel compounds) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 13138-45-9 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 13478-00-7 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 13138-45-9 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# 13478-00-7 can be found on the following state right to know lists: California, (listed as Nickel compounds), New Jersey, (listed as Nickel compounds), New Jersey, (listed as Nickel, inorganic compounds), Pennsylvania, (listed as Nickel compounds), Minnesota, (listed as Nickel soluble compounds).

CAS# 13138-45-9 can be found on the following state right to know lists: California, (listed as Nickel nitrate), California, (listed as Nickel compounds), New Jersey, Pennsylvania, Minnesota, (listed as Nickel soluble compounds), Massachusetts.

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California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Nickel dinitrate hexahydrate, listed as `Nickel compounds', a chemical known to the state of California to cause cancer. WARNING: This product contains Nickel dinitrate anhydrous, listed as `Nickel compounds', a chemical known to the state of California to cause cancer. California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T O N

Risk Phrases:

- R 20/22 Harmful by inhalation and if swallowed.
- R 38 Irritating to skin.
- R 41 Risk of serious damage to eyes.
- R 42/43 May cause sensitization by inhalation and skin contact.
- R 8 Contact with combustible material may cause fire.
- R 49 May cause cancer by inhalation.
- R 48/23 Toxic : danger of serious damage to health by prolonged exposure through inhalation.
- R 61 May cause harm to the unborn child.
- R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- R 68 Possible risk of irreversible effects.

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# 13478-00-7: No information available.
- CAS# 13138-45-9: 2

Canada - DSL/NDSL

CAS# 13138-45-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 13478-00-7 (listed as Nickel soluble compounds) is listed on the Canadian Ingredient Disclosure List.

CAS# 13138-45-9 is listed on the Canadian Ingredient Disclosure List.

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MSDS Creation Date: 8/06/1998

Revision #5 Date: 12/01/2006

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet
Niobium, powder, -60 to -325 mesh, 99.8%

ACC# 99042

Section 1 - Chemical Product and Company Identification

MSDS Name: Niobium, powder, -60 to -325 mesh, 99.8%

Catalog Numbers: AC317460000, AC317460250, AC317480000, AC317480250

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
7440-03-1	Niobium, powder	99.8	231-113-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: grey solid.

Pyrophoric. Flammable in the form of dust when exposed to flame or by chemical reaction. **Danger!** May be pyrophoric and become spontaneously flammable in air. May cause eye, skin, and respiratory tract irritation.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Material Safety Data Sheets, Carver Hall RM 208-A

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.

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: Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material can spontaneously ignite (pyrophoric) when exposed to air at normal or slightly elevated temperatures. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. May re-ignite after fire is extinguished. Finely divided dusts may exhibit pyrophoric tendencies.

Extinguishing Media: Use dry chemical. Contact professional fire-fighters immediately.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Isolate area and deny entry. Provide ventilation. Place under an inert atmosphere.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Minimize dust generation and accumulation. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Take precautionary measures against static discharges. Avoid ingestion and inhalation. Handle under an inert atmosphere.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. 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
Niobium, powder	none listed	none listed	none listed

OSHA Vacated PELs: Niobium, powder: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: grey

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 4742 deg C

Freezing/Melting Point:2468 deg C

Decomposition Temperature:Not available.

Solubility: Insoluble.

Specific Gravity/Density:Not available.

Molecular Formula:Nb

Molecular Weight:92.91

Section 10 - Stability and Reactivity

Chemical Stability: Powder or liquid is pyrophoric. Spontaneously flammable in air.

Material Safety Data Sheets, Carver Hall RM 208-A

Conditions to Avoid: Incompatible materials, ignition sources, dust generation, exposure to air.
Incompatibilities with Other Materials: Acids, bases, halogens, oxidizing agents.
Hazardous Decomposition Products: Nature of decomposition products unknown..
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-03-1: QT9900000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7440-03-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	PYROPHORIC METALS, N.O.S.	PYROPHORIC METALS, N.O.S.

Material Safety Data Sheets, Carver Hall RM 208-A

Hazard Class:	4.2	4.2
UN Number:	UN1383	UN1383
Packing Group:	I	I

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-03-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-03-1 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:

F

Risk Phrases:

R 17 Spontaneously flammable in air.

Safety Phrases:

Material Safety Data Sheets, Carver Hall RM 208-A

S 33 Take precautionary measures against static discharges.

WGK (Water Danger/Protection)

CAS# 7440-03-1: No information available.

Canada - DSL/NDSL

CAS# 7440-03-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B6.

This product has been classified in accordance with 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

MSDS Creation Date: 3/25/1999

Revision #5 Date: 9/26/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Phenol red, indicator

ACC# 01196

Section 1 - Chemical Product and Company Identification

MSDS Name: Phenol red, indicator

Catalog Numbers: AC151430000, AC151430050, AC151430250

Synonyms: Phenolsulfonephthalein.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
143-74-8	Phenol red	95+	205-609-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: red-brown powder.

Warning! Causes eye, skin, and respiratory tract irritation.

Target Organs: Kidneys, 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: Laboratory experiments have resulted in mutagenic effects. May cause kidney damage.

Section 4 - First Aid Measures

Material Safety Data Sheets, Carver Hall RM 208-A

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a cool, dry place. Store in a tightly closed container. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Material Safety Data Sheets, Carver Hall RM 208-A

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: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: dark red - red-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: > 300 deg C

Decomposition Temperature: Not available.

Solubility: 0.77 g/L

Specific Gravity/Density: Not available.

Molecular Formula: C₁₉H₁₄O₅S

Molecular Weight: 354.38

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

Material Safety Data Sheets, Carver Hall RM 208-A

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: Mutation in microorganisms: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 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 TPO.

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 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# 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:

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.

Material Safety Data Sheets, Carver Hall RM 208-A

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 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

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997

Revision #5 Date: 3/11/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- PHOSPHOMOLYBDIC ACID HYDRATE, A237100 -- -

=====
Product Identification
=====

Product ID:PHOSPHOMOLYBDIC ACID HYDRATE, A237100

MSDS Date:09/02/1997

FSC:NIIN:Submitter:N EN

Status Code:A

MSDS Number: CJTDB

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:ONE REAGENT LANE

City:FAIRLAWN

State:NJ

ZIP:07410

Country:US

Info Phone Num:201-796-7100

Emergency Phone Num:201-796-7100

Resp. Party Other MSDS Num.:ACC# 18685

Chemtrec Ind/Phone:(800)424-9300

CAGE:1B464

=== Contractor Identification ===

Company Name:FISHER SCIENTIFIC CO

Address:2000 PARK LN

Box:City:PITTSBURGH

State:PA

ZIP:15275

Country:US

Phone:412-490-8586

CAGE:22527

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:MOLYBDOPHOSPHORIC ACID (H3MO12PO40) HYDRATE;
(PHOSPHOMOLYBDIC ACID HYDRATE)

CAS:51429-74-4

= Wt:100.

Other REC Limits:N/K

OSHA PEL:N/K

OSHA STEL:N/K

ACGIH TLV:N/K

ACGIH STEL:N/K

=====
Hazards Identification
=====

LD50 LC50 Mixture:NOT AVAILABLE.

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE: EYES: MAY CAUSE EYE BURNS.

EXPOSURE TO PARTICULATES OR SOLUTION MAY CAUSE CONJUNCTIVITIS,
ULCERATION, AND CORNEAL ABNORMALITITES. SKIN: CONTACT WITH SKIN

Material Safety Data Sheets, Carver Hall RM 208-A

CAUSES IRRITATION AND POSSIBLE BURNS, ESPECIALLY IF THE SKIN IS WET OR MOIST. INGESTION: MAY CAUSE SEVERE GASTROINTESTINAL TRACT IRRITATION WITH NAUSEA, VOMITING AND POSSIBLE BURNS. INHALATION: IF HEATED, DUST OR FUME MAY CAUSE RESPIRATORY TRACT IRRITATION. CHRONIC: CHRONIC EXPOSURE CAN LEAD TO NECROSIS OF THE JAW, OR 'PHOSSY-JAW'. TARGET ORGANS: NONE.

Effects of Overexposure:SEE HEALTH HAZARDS.

===== First Aid Measures =====

First Aid:EYES: FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MINS, OCCASIONALLY LIFTING UPPER & LOWER LIDS. GET MEDICAL AID IMMEDIATELY. SKIN: GET MEDICAL AID IMMEDIATELY. FLUSH SKIN W/PLENTY OF SOAP & WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING & SHOES. INGEST: DO NOT INDUCE VOMIT. IF VICTIM IS CONSCIOUS & ALERT, GIVE 2-4 CUPFULS OF MILK/WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GIVE MILK OF MAGNESIA. INHAL: REMOVE FROM EXPOS TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL AID. NOTES TO MD : TREAT SYMPTOMATICALLY & SUPPORTIVELY.

===== Fire Fighting Measures =====

Extinguishing Media:SUBSTANCE IS NON-COMBUSTIBLE; USE AGENT MOST APPROPRIATE TO EXTINGUISH SURROUNDING FIRE.
Fire Fighting Procedures:WEAR NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .
Unusual Fire/Explosion Hazard:MATERIAL WILL NOT BURN. STRONG OXIDIZER. CONTACT WITH COMBUSTIBLE MATERIALS MAY CAUSE A FIRE. NFPA RATINGS: NOT PUBLISHED.

===== Accidental Release Measures =====

Spill Release Procedures:USE PROPER PERSONAL PROTECTIVE EQUIPMENT AS INDICATED IN CONTROL MEASURES SECTION. SWEEP UP OR ABSORB MATERIAL, THEN PLACE INTO A SUITABLE CLEAN, DRY, CLOSED CONTAINER FOR DISPOSAL.

===== Handling and Storage =====

Handling and Storage Precautions:USE WITH ADEQUATE VENTILATION. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. DO NOT INGEST OR INHALE. KEEP REFRIGERATED. KEEP CONTAINERS TIGHTLY CLOSED.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS FOR EUROPEAN STANDARD EN 149 MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. WEAR NIOSH APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .
Ventilation:USE PROCESS ENCLOSURE, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO CONTROL AIRBORNE LEVELS.
Protective Gloves:WEAR APPROPRIATE PROTECTIVE GLOVES. WEAR IMPERVIOUS GLOVES .
Eye Protection:ANSI APPROVED CHEMICAL WORKERS GOGGLES AND FULL LENGTH FACESHIELD .

Material Safety Data Sheets, Carver Hall RM 208-A

Other Protective Equipment:EYEWASH AND DELUGE SHOWER MEETING ANSI DESIGN CRITERIA . WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT SKIN EXPOSURE.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE. DISCARD CONTAMINATED CLOTHING.

Supplemental Safety and Health
MOLECULAR FORMULA: 20MOO3-2H3PO4.

===== Physical/Chemical Properties =====

Boiling Pt:=78.C, 172.4F
Melt/Freeze Pt:>78.C, 172.4F
M.P/F.P Text:78C - 90C
Spec Gravity:3.15
Solubility in Water:SOLUBLE
Appearance and Odor:YELLOW SOLID; NO ODOR REPORTED.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
STRONG BASES. METALS.
Stability Condition to Avoid:INCOMPATIBLE MATERIALS.
Hazardous Decomposition Products:OXIDES OF PHOSPHORUS, OXIDES OF MOLYBDENUM.

===== Toxicological Information =====

Toxicological Information:CAS # 51429-74-4 UNLISTED. LD50/LC50: NOT AVAILABLE. CARCINOGENICITY: CAS # 51429-74-4: NOT LISTED BY ACGIH, IARC, NIOSH, NTP, OR OSHA. EPIDEMIOLOGY, TERATOGENICITY, REPRODUCTIVE EFFECTS, NEUROTOXICIT Y, MUTAGENICITY, OTHER STUDIES: NO DATA AVAILABLE.

===== Ecological Information =====

Ecological:ECOTOXICITY: NOT AVAILABLE. ENVIRONMENTAL FATE: NOT AVAILABLE. PHYSICAL/CHEMICAL: NOT AVAILABLE. OTHER: NOT AVAILABLE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL, STATE, AND LOCAL REGULATIONS. RCRA D-SERIES MAXIMUM CONCENTRATION OF CONTAMINANTS: NONE LISTED. RCRA D-SERIES CHRONIC TOXICITY REFERENCE LEVELS: NONE LI STED. RCRA F-SERIES: NONE LISTED. RCRA P-SERIES: NONE LISTED. RCRA U-SERIES: NONE LISTED.

===== MSDS Transport Information =====

Transport Information:US DOT: SHIPPING NAME: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (PHOSPHOMOLYBDIC ACID); HAZARD CLASS: 8; UN NUMBER: UN3260; PACKING GROUP: II. IATA, RID/ADR, IMO: NO INFORMATION AVAILABLE. CANADA TD G: SHIPPING NAME: CORROSIVE SOLID NOS (PHOSPHOMOLYBDIC ACID); HAZARD CLASS: 8 (9.2); UN NUMBER: UN1759; PACKING GROUP: III.

===== Regulatory Information =====

Material Safety Data Sheets, Carver Hall RM 208-A

SARA Title III Information:SECTION 302 (RQ): NONE OF THE CHEMICALS IN THIS MATERIAL HAVE AN RQ. SECTION 302 (TPQ): NONE OF THE CHEMICALS IN THIS MATERIALS HAVE A TPQ. SECTION 313: NO CHEMICALS ARE REPORTABLE UNDER SECTION 313.

Federal Regulatory Information:US FED: TSCA: CAS # 51429-75-5 IS NOT ON TSCA INVENTORY. IT IS A HYDRATE & EXEMPT FROM TSCA INVENTORY REQS (40 CFR 720.3 (U) (2)). HLTH & SFTY REPORTING LIST: NONE OF THE CHEMS ARE ON THE HLTH & SFTY REPORTING LIST. CHEM TEST RULES: NO OF THE CHEMS IN THIS PROD ARE UNDER A CHEM TEST RULE. SECTION 12 (B): NONE OF THE CHEMS ARE LISTED UNDER TSCA SECTION 12 (B). TSCA SIGNIFICANT NEW USE RULE: NONE OF THE CHEMS IN THIS MATL HAVE A SNUR UNDER TSCA. CLEAN AIR ACT: THIS MATL DOES NOT CONTAIN ANY HAZ AI R POLLUTANTS. THIS MATL DOES NOT CONTAIN ANY CLASS 1/CLASS 2 OZONE DEPLETORS. (OTHER INFO)

State Regulatory Information:CAS # 51429-74-4 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.

===== Other Information =====

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Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- S80128 PHOSPHOTUNGSTIC ACID HYDRATE -- -

===== Product Identification =====

Product ID:S80128 PHOSPHOTUNGSTIC ACID HYDRATE

MSDS Date:09/02/1997

FSC:NIIN:Submitter:F BT

Status Code:A

MSDS Number: CJZHN

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:1 REAGENT LANE

City:FAIRLAWN

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:PHOSPHOTUNGSTIC ACID HYDRATE

CAS:12501-23-4

= Wt:100.

===== Hazards Identification =====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Health Hazards Acute and Chronic:MAY CAUSE SKIN & EYE BURNS. ULCERATION OF THE CONJUNCTIVA & CORNEA. INGESTION: GASTROINTESTINAL BURNS. INHALATION: IRRITATION OF THE RESPIRATORY TRACT W/BURNING IN THE NOSE & THROAT & PULMONARY EDEMA. CAUSES CHEMICAL BURNS TO THE RESPIRATORY TRACT.

Effects of Overexposure:BURNS, PAIN, NAUSEA, COUGHING, WHEEZING, SHORTNESS OF BREATH, VOMITING, DIARRHEA, SHOCK

===== First Aid Measures =====

First Aid:EYES: FLUSH W/PLENTY OF WATER FOR 15 MINS OCCASIONALLY LIFTING THE UPPER & LOWER LIDS. SKIN: FLUSH W/PLENTY OF SOAP & WATER FOR 15 MINS. INGESTION: DON'T INDUCE VOMITING. IF CONSCIOUS & ALERT. GIVE 2- 4 CUPFULS OF MILK/WATER. NEVER GIVE ANYTHING BY MOUTH IF UNCONSCIOUS. INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR. GIVE CPR/OXYGEN IF NECESSARY. OBTAIN MEDICAL ATTENTION IN ALL CASES. NOTES TO PHYSI CIAN: TREAT SYMPTOMATICALLY & SUPPORTIVELY.

===== Fire Fighting Measures =====

Flash Point:NONE

Material Safety Data Sheets, Carver Hall RM 208-A

Lower Limits:NONE

Upper Limits:NONE

Extinguishing Media:USE EXTINGUISHING MEDIA MOST APPROPRIATE FOR THE SURROUNDING FIRE.

Fire Fighting Procedures:WEAR A SELF CONTAINED BREATHING APPARATUS IN PRESSURE-DEMAND MSHA/NIOSH APPROVED & FULL PROTECTIVE GEAR.

Unusual Fire/Explosion Hazard:DECOMPOSES AT HIGH TEMPERATURES, RESULTING IN TOXIC & CORROSIVE PRODUCTS.

===== Accidental Release Measures =====

Spill Release Procedures:ABSORB W/INERT MATERIALS; DRY SAND, EARTH. THEN PLACE INTO A CHEMICAL WASTE CONTAINER. CLEAN UP IMMEDIATELY. OBSERVE PRECAUTIONS IN THE PROTECTIVE EQUIPMENT SECTION.

===== Handling and Storage =====

Handling and Storage Precautions:USE W/ADEQUATE VENTILATION. KEEP AWAY FROM HEAT & FLAME. KEEP REFRIGERATED.

Other Precautions:DON'T GET ON SKIN/IN EYES. DON'T INGEST/INHALE.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:OSHA RESPIRATOR REGULATIONS FOUND IN 29CFR 1910.134. ALWAYS USE A NIOSH-APPROVED RESPIRATOR WHEN NECESSARY.

Ventilation:USE ADEQUATE VENTILATION TO KEEP AIRBORNE CONCENTRATIONS LOW.

Protective Gloves:PROTECTIVE

Eye Protection:SAFETY GLASSES, CHEMICAL GOGGLES

Other Protective Equipment:PROTECTIVE CLOTHING

Work Hygienic Practices:REMOVE/LAUNDER CONTAMINATED CLOTHING & SHOES BEFORE REUSE. WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

WASH HANDS BEFORE EATING. DISCARD CONTAMINATED SHOES.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:DECOMPOSES

Vapor Density:224.8

Solubility in Water:COMPLETE

Appearance and Odor:WHITE SOLID

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

INCOMPATIBLE MATERIALS, STRONG BASES

Stability Condition to Avoid:HIGH TEMPERATURES, FLAMES, REFRIGERATION

Hazardous Decomposition Products:PHOSPHINE, OXIDES OF PHOSPHORUS

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.

===== MSDS Transport Information =====

Transport Information:SHIPPING NAME: CORROSIVE SOLID, ACIDIC, INORGANIC N.O.S PHOSPHOTUNGSTIC ACID.

Material Safety Data Sheets, Carver Hall RM 208-A

===== Other Information =====

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Material Safety Data Sheet

Potassium Bicarbonate

ACC# 19230

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium Bicarbonate

Catalog Numbers: P184-500, P235-12, P235-12LC, P235-212, P235-500

Synonyms: Potassium Hydrogen Carbonate; Baking Soda.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
298-14-6	Carbonic Acid, Monopotassium Salt	100	206-059-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear to white crystalline powder.

Caution! May cause eye, skin, and respiratory 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: Get medical aid. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin: Get medical aid. Rinse area with large amounts of water for at least 15 minutes.

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.

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 available.

Autoignition Temperature: None.

Explosion Limits, Lower: None.

Upper: None.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

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
Carbonic Acid, Monopotassium Salt	none listed	none listed	none listed

OSHA Vacated PELs: Carbonic Acid, Monopotassium Salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: clear to white

Odor: odorless

pH: 8.2 (0.1M solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Decomposes

Freezing/Melting Point: 100 deg C

Decomposition Temperature: > 100 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 2.17

Molecular Formula: KHCO₃

Molecular Weight: 100.1035

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Acidic conditions, bases.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, oxides of carbon, oxides of potassium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 298-14-6: FG1840000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 298-14-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Rapidly dissolves in water, remains in atmosphere as particulate.

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

Material Safety Data Sheets, Carver Hall RM 208-A

	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# 298-14-6 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 TPO.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 298-14-6 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:

Material Safety Data Sheets, Carver Hall RM 208-A

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 298-14-6: 0

Canada - DSL/NDSL

CAS# 298-14-6 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

Section 16 - Additional Information

MSDS Creation Date: 3/24/1998

Revision #4 Date: 11/10/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheets, Carver Hall RM 208-A

SIGMA CHEMICAL CO -- POTASSIUM ACETATE SIGMAULTRA, P5708 -- 6505-00N093123

=====
Product Identification
=====

Product ID:POTASSIUM ACETATE SIGMAULTRA, P5708

MSDS Date:01/01/1999

FSC:6505

NIIN:00N093123

Status Code:A

MSDS Number: CJXKG

=== Responsible Party ===

Company Name:SIGMA CHEMICAL CO

Box:14508

City:ST LOUIS

State:MO

ZIP:63178

Country:US

Info Phone Num:314-771-5765

Emergency Phone Num:314-771-5765

CAGE:21076

=== Contractor Identification ===

Company Name:SIGMA CHEMICAL COMPANY

Address:3050 SPRUCE ST

Box:14508

City:ST LOUIS

State:MO

ZIP:63178

Country:US

Phone:314-771-5765

CAGE:21076

=====
Composition/Information on Ingredients
=====

Ingred Name:ACETIC ACID, POTASSIUM SALT; (POTASSIUM ACETATE).

LD50:(ORAL,RAT) 3250 MG/KG.

CAS:127-08-2

RTECS #:AJ3325000

= Wt:100.

=====
Hazards Identification
=====

LD50 LC50 Mixture:SEE INGREDIENTS & TOXICOLOGICAL INFO.

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE: MAY BE HARMFUL BY INHALATION,
INGESTION OR SKIN ABSORPTION. CAUSES EYE AND SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY
TRACT.

Effects of Overexposure:SEE HEALTH HAZARDS.

=====
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.
INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGESTION:
WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL MD.

Material Safety Data Sheets, Carver Hall RM 208-A

===== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

Fire Fighting Procedures:USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

===== Accidental Release Measures =====

Spill Release Procedures:WEAR NIOSH APPROVED RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

===== Handling and Storage =====

Handling and Storage Precautions:DO NOT BREATHE DUST. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. KEEP TIGHTLY CLOSED. STORE IN A COOL, DRY PLACE.

Other Precautions:IRRITANT. IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:NIOSH APPROVED RESPIRATOR.

Ventilation:MECHANICAL EXHAUST REQUIRED.

Protective Gloves:COMPATIBLE CHEMICAL-RESISTANT GLOVES.

Eye Protection:ANSI APPROVED CHEMICAL WORKERS GOGGLES .

Other Protective Equipment:ANSI APPROVED EMERGENCY EYE WASH AND DELUGE SHOWER . WEAR SUITABLE PROTECTIVE CLOTHING.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

MFR'S INFORMATION ON INGREDIENTS: MF: C2H3KO2. EC NO: 204-822-2.

===== Physical/Chemical Properties =====

Appearance and Odor:WHITE POWDER.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

STRONG OXIDIZING AGENTS.

Hazardous Decomposition Products:TOXIC FUMES OF: CARBON MONOXIDE, CARBON DIOXIDE.

Conditions to Avoid Polymerization:WILL NOT OCCUR.

===== Toxicological Information =====

Toxicological Information:TO THE BEST OF MFR'S KNOWLEDGE, THE CHEMICAL, PHYSICAL & TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED. TOXICITY DATA: LD50: (ORAL,RAT) 3250 MG/KG - AIHAAP 30,470,1969. ONLY SELECTED REGISTERED TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

===== Ecological Information =====

Material Safety Data Sheets, Carver Hall RM 208-A

Ecological:DATA NOT YET AVAILABLE.

===== Disposal Considerations =====

Waste Disposal Methods:DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

===== MSDS Transport Information =====

Transport Information:CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

===== Regulatory Information =====

Federal Regulatory Information:EUROPEAN INFORMATION: IRRITANT; R 36/37/38 - IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN. S 26 - IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE. S 36 - WEAR SUITABLE PROTECTIVE CLOTHING. REVIEWS, STANDARDS AND REGULATIONS: OEL=MAK. NOHS 1974: HZD 84468; NIS 12, TNF 1381; NOS 16; TNE 4523. NOES 1983: HZD 84468; NIS 71; TNF 5360; NOS 78; TNE 204777; TFE 109940. EPA TSCA SECTION 8 (B) CHEMICAL INVENTORY.

State Regulatory Information:

===== Other Information =====

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Material Safety Data Sheets, Carver Hall RM 208-A

EM SCIENCE -- POTASSIUM BIPHTHALATE;POTASSIUM ACID PHTHAL -- 6850-00N035996

=====
Product Identification
=====

Product ID:POTASSIUM BIPHTHALATE;POTASSIUM ACID PHTHAL

MSDS Date:10/27/1987

FSC:6850

NIIN:00N035996

MSDS Number: BQLPD

=== Responsible Party ===

Company Name:EM SCIENCE

Address:480 DEMOCRAT RD

City:GIBBSTOWN

State:NJ

ZIP:08027

Country:US

Info Phone Num:609-354-9200

Emergency Phone Num:800-424-9300 (CHEMTREC)

CAGE:DO242

=== Contractor Identification ===

Company Name:E M SCIENCE DIV OF E M INDUSTRIES INC

Address:480 DEMOCRAT ROAD

Box:70

City:GIBBSTOWN

State:NJ

ZIP:08027

Country:US

Phone:800-222-0342/609-423-6300

CAGE:63612

Company Name:EM SCIENCE

Address:480 DEMOCRAT RD

City:GIBBSTOWN

State:NJ

ZIP:08927

Phone:800-424-9300 (CHEMTREC)

CAGE:DO242

=====
Composition/Information on Ingredients
=====

Ingred Name:POTASSIUM HYDROGEN PHTHALATE; (POTASSIUM BIPHTHALATE),
(POTASSIUM ACID PHTHALATE)

CAS:877-24-7

Fraction by Wt: 100%

=====
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:DUST MAY BE IRRITATING TO EYES.

PROLONGED SKIN CONTACT MAY CAUSE IRRITATION.

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:SEE HEALTH HAZARDS.

Medical Cond Aggravated by Exposure:DATA NOT AVAILABLE.

=====
First Aid Measures
=====

First Aid:SKIN: WASH THORO WITH SOAP AND WATER. EYES: IMMED FLUSH THORO
WITH WATER FOR AT LEAST 15 MIN. INHAL: REMOVE TO FRESH AIR; GIVE

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ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. INGEST: DRINK WATER AND INDUCE VOMITING IMMEDIATE AS DIRECTED BY MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.

===== Fire Fighting Measures =====

Flash Point:NONE

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, "ALCOHOL" FOAM, WATER SPRAY.

Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:NONE.

===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA OF ALL UNNECESSARY PERSONS.WEAR SUITABLE PROTECTIVE EQUIPMENT LISTED. ELIMINATE ANY IGNITION SOURCES UNTIL AREA IS DETERMINED TO BE FREE FROM EXPLOSION/FIRE HAZARD. CONTAIN RELIEF & ELIMINATE ITS SOURCES, IF THIS CAN BE DONE WITHOUT RISK. TAKE UP & CONTAINERIZE FOR PROPER DISPOSAL.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER CLOSED. STORE IN A COOL, DRY AREA. DO NOT BREATHE DUST. DO NOT GET IN EYES. AVOID PROLONGED OR REPEATED SKIN CONTACT.

Other Precautions:HANDLING CARE GENERALLY IN KEEPING WITH SAFE LABORATORY PRACTICES IS RECOMMENDED.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN .

Ventilation:MATERIAL SHOULD BE HANDLED/TRANSFERRED IN AN APPROVED FUME HOOD/W/ Adequate Ventilation.

Protective Gloves:NEOPRENE, PVC/EQUIVALENT.

Eye Protection:CHEMICAL WORKERS GOGGLES .

Other Protective Equipment:PROTECTIVE CLOTHING. EYE WASH AND SAFETY EQUIPMENT SHOULD BE READILY AVAILABLE.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING. DO NOT TAKE INTERNALLY.

Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

HCC:N1

Melt/Freeze Point:Melting Point/Fusion Point Text:563F,295C

Specific Gravity:1.64 (at 20°C)

Solubility in Water:8%

Appearance and Odor:COLORLESS OR WHITE, ODORLESS CRYSTALS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES
NONE SPECIFIED BY MANUFACTURER.

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Stability Condition to Avoid:NONE.

Hazardous Decomposition Products:OXIDES OF CARBON, K*20.

===== Disposal Considerations =====

Waste Disposal Methods:COMPLY W/FEDERAL, STATE, AND LOCAL REGULATIONS
ON REPORTING RELEASES. REFER TO REGULATORY INFO FOR REPORTABLE QTY
AND OTHER REGULATORY DATA. ALWAYS CONT A PERMITTED WASTE DISPOSER
(TSD) TO ASSURE COMP LIANCE W/ALL CURRENT LOC, ST & FED REGS.

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particular situation.

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FISHER SCIENTIFIC -- P-193, POTASSIUM BISULFATE -- 6810-00N015813

===== Product Identification =====

Product ID:P-193, POTASSIUM BISULFATE

MSDS Date:06/03/1988

FSC:6810

NIIN:00N015813

MSDS Number: BPJMN

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:1 REAGENT LANE

City:FAIR LAWN

State:NJ

ZIP:07410-2802

Country:US

Info Phone Num:201-796-7100

Emergency Phone Num:201-796-7100

CAGE:1B464

=== Contractor Identification ===

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV

Address:1 REAGENT LANE

Box:City:FAIRLAWN

State:NJ

ZIP:07410-2802

Country:US

Phone:201-796-7100

CAGE:1B464

===== Composition/Information on Ingredients =====

Ingred Name:POTASSIUM BISULFATE

CAS:7646-93-7

RTECS #:TS7200000

Fraction by Wt: 100%

Ingred Name:CNDTNS TO AVOID:COMBUSTIBLES (WOOD, PAPER, OIL, ETC).

RTECS #:9999999ZZ

Ingred Name:EFTS OF OVEREXP:BRONCH & GI DISTURBANCES. SKIN:DERM.

EYE:CONJUNCTIVITIS. INGEST:MAY RSLT IN EFTS AS W/ACUTE INGESTION.

RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC:BURNS, COVER AREA W/STERILE, DRY DRESSING.

BANDAGE SECURELY, BUT NOT TOO TIGHTLY. GET MD IMMED. (ING 5)

RTECS #:9999999ZZ

Ingred Name:ING 4:EYE:WASH IMMED W/LRG AMTS OF WATER FOR AT LEAST 15

MINS, OCCASIONALLY LIFTING UPPER & LOWER LIDS, UNTIL NO (ING 6)

RTECS #:9999999ZZ

Ingred Name:ING 5:EVIDENCE OF CHEM REMAINS. IN CASE OF BURNS, APPLY

STERILE BANDAGES LOOSELY W/OUT MEDICATION. GET MD IMMED. (ING 7)

RTECS #:9999999ZZ

Ingred Name:ING 6:INGEST:IF CONSCIOUS, GIVE LRG QTYS OF WATER IMMED TO

DILUTE ACID. DO NOT INDUCE VOMIT. GET MD IMMED. NO (ING 8)

RTECS #:9999999ZZ

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Ingred Name:ING 7:SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY & SUPPORTIVELY.
RTECS #:9999999ZZ

Ingred Name:SPILL PROC:MOVE CNTNRS FROM SPILL AREA. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISP. KEEP UNNEC (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9:PEOPLE AWAY. ISOLATE HAZARD AREA & DENY ENTRY.
RTECS #:9999999ZZ

==== Hazards Identification =====

LD50 LC50 Mixture:LD50:(ORAL RAT):2340 MG/KG.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:INHAL:SYMPS OF REST TRACT IRRIT INCL COUGHING, CHOKING, PAIN IN NOSE/MOUTH/THROAT & BURNS OF MUC MEMB. PULM EDEMA MAY DEVELOP, SYMPS INCL TIGHTNESS IN CHEST, DYSPNEA, FROTHY SPUTUM, CYANOSIS & D IZZ. SKIN:SEVERE IRRIT, PAIN & POSS BURNS. EYE:SEVERE IRRIT, PAIN/BURNS, POSS SEVERE. INGEST:IMMED PAIN(EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:HLTH HAZ:& SEVERE BURNS OF MUC MEMB. DISCOLORATION OF TISS. SWALLOWING & SPEECH MAY BE DFCLT AT FIRST & THEN ALMOST IMPOSSIBLE. THE EFTS ON ESOPHAGUS & GI TRACT RANGE FROM IRRIT TO SEVERE CORROSION. EDEMA OF EPIGLOTTIS & SHOCK MAY OCCUR. CHRONIC:INHAL:INFLAMMATORY & ULCERATIVE CHANGES IN MOUTH & POSSIBLE (ING 3)
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

==== First Aid Measures =====

First Aid:INHAL:MOVE TO FRESH AIR IMMED. IF BRTHG STOPPED, GIVE ARTF RESP. MAINTAIN AIRWAY & BLOOD PRESS & GIVE O*2 IF AVAIL. KEEP AFFECTED PERSON WARM/AT REST. ADMIN OF O*2 SHOULD BE PERFORMED BY QUALIFIED PER S. GET MD IMMED. SKIN:REMOVE CONTAM CLTHG & SHOES IMMED. WASH AFFECTED AREA W/SOAP/MILD DETERGENT & LRG AMTS OF WATER UNTIL NO EVIDENCE OF CHEM REMAINS (AT LEAST 15-20 MINS). IN CASE OF CHEM (ING 4)

==== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CO*2, HALON, H*2O SPRAY OR STANDARD FOAM. FOR LARGER FIRES:H*2O SPRAY, FOG OR STANDARD FOAM.
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT . MOVE CNTNRS FROM FIRE AREA IF POSS. COOL CNTNRS EXPOSED TO FLAMES W/WATER FROM (SUPP DATA)
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

==== Accidental Release Measures =====

Spill Release Procedures:OCCUP SPILL:DO NOT TOUCH SPILLED MATL. STOP LEAK IN YOU CAN W/OUT RISK. FOR SMALL SPILLS, TAKE UP W/SAND OR OTHER ABSORB MATL & PLACE INTO CNTNRS FOR LATER DISP. FOR SMALL DRY SPILLS, W/CLEAN SHOVEL P LACE MATL INTO CLEAN, DRY CNTNR & COVER. (ING 9)

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Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

==== Handling and Storage =====

Handling and Storage Precautions:STORE AWAY FROM INCOMPATIBLE LIQUIDS.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

==== Exposure Controls/Personal Protection =====

Respiratory Protection:THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON THE CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED WORKING LIMITS OF RESPIRATOR & BE NIOSH/MSHA APPROVED. CONTACT NEHC FOR ADDITIONAL INFORMATION .

Ventilation:PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION SYSTEM.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:CHEM WORK GOGG/FULL LENGTH FSHLD .

Other Protective Equipment:IMPERVIOUS CLOTHING, EMERGENCY EYE WASH FOUNTAIN AND QUICK DRENCH SHOWER.

Work Hygienic Practices:CONTACT LENSES SHOULD NOT BE WORN.

Supplemental Safety and Health

PH:ACIDIC IN SOLUTION. FIRE FIGHT PROC:SIDE UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM STORAGE TANK ENDS. DO NOT USE WATER DIRECTLY ON MATERIAL. IF LARGE AMOUNTS OF COMBUSTIBLE MATERIALS ARE INVOLVED, USE WATER SPRAY OR FOG IN FLOODING AMTS. AVOID BREATHING CORROSIVE DUSTS/FUMES FROM BURNING MATERIAL, KEEP UPWIND.

==== Physical/Chemical Properties =====

HCC:C1

Boiling Pt:B.P. Text:DECOMPOSES

Melt/Freeze Pt:M.P/F.P Text:417F,214C

Vapor Pres:NEGLIGIBLE

Spec Gravity:2.322

pH:SUPDAT

Solubility in Water:36.3% @ 0C

Appearance and Odor:COLORLESS CRYSTALLINE SOLID WITH SULFUR ODOR

==== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

ALKALI, BASES/OXIDIZERS. METALS:CORROSIVE IN PRESENCE OF MOISTURE.

ALUMINUM:POSS EXPLO ON MELTING. MAGNESIUM:POSS EXPLO.

Stability Condition to Avoid:MAY BURN BUT DOES NOT READILY IGNITE.

FLAMM, POISONOUS GASES MAY ACCUMULATE IN TANKS & HOPPER CARS. MAY IGNITE (ING 2)

Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE HIGHLY TOXIC FUMES OF OXIDES OF SULFUR & POTASSIUM OXIDE.

==== Disposal Considerations =====

Waste Disposal Methods:OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE.

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FISHER SCIENTIFIC -- P201500, POTASSIUM BITARTRATE P-201 -- 6505-00N031397

=====
Product Identification
=====

Product ID:P201500, POTASSIUM BITARTRATE P-201

MSDS Date:04/25/1985

FSC:6505

NIIN:00N031397

MSDS Number: BPLHW

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:1 REAGENT LANE

City:FAIR LAWN

State:NJ

ZIP:07410-2802

Country:US

Info Phone Num:201-796-7100

Emergency Phone Num:201-796-7100

CAGE:1B464

=== Contractor Identification ===

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV

Address:1 REAGENT LANE

Box:City:FAIRLAWN

State:NJ

ZIP:07410-2802

Country:US

Phone:201-796-7100

CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:TARTARIC ACID, MONOPOTASSIUM SALT; (POTASSIUM BITARTRATE)

CAS:868-14-4

RTECS #:WW8223000

=====
Hazards Identification
=====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.

Routes of Entry: Inhalation:YES Skin:NO Ingestion:YES

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE/CHRONIC:INHAL:NO DATA AVAILABLE.

SKIN: NONE KNOWN IN HUMANS. EYE:MAY CAUSE IRRITATION . INGEST:NO

EFFECTS HAVE BEEN REPORTED IN HUMANS.

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:SEE HEALTH HAZARDS.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

First Aid:INHAL:REMOVE FROM EXPOS AREA TO FRESH AIR IMMED. IF BRTHG HAS

STOPPED, GIVE ARTIF RESP. KEEP AFFECTED PERSON WARM & AT REST. GET

MD ATTN. SKIN:REMOVE CONTAM CLTHG & SHOES. WASH AFFECTED AREA

W/SOAP/MI LD DETERGENT & LRG AMTS OF WATER UNTIL NO EVIDENCE OF

CHEM REMAINS (APPROX 10-20 MIN). GET MD ATTN IF NEEDED. EYE:WASH

IMMED W/LRG AMTS OF WATER, OCCAS LIFTING UPPER & LOWER LIDS, UNTIL

NO (SUPDAT)

=====
Fire Fighting Measures
=====

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Flash Point:NON-FLAMMABLE

Extinguishing Media:DRY CHEM, CO2, WATER SPRAY/ALCOHOL FOAM. FOR LRG FIRES USE WATER SPRAY, FOG/ALCOHOL FOAM.

Fire Fighting Procedures:USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT . NO ACUTE HAZARD. MOVE CONTR FROM FIRE AREA IF POSS. AVOID BRTHG VAP/DUST; KEEP UPWIND.

Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE AND EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME.

===== Accidental Release Measures =====

Spill Release Procedures:NO SPECIAL PRECAUTIONS INDICATED.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:AVOID REPEATED OR PROLONGED CONTACT WITH THIS SUBSTANCE.

Other Precautions:NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:AT HIGH LEVELS USE NIOSH/MSHA APPROVED DUST MASK.

Ventilation:PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION SYSTEM.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:CHEM WORK GOGG/FULL LENGTH FCSHLD

Other Protective Equipment:WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, EMPLOYER SHALL PROVIDE (SUPDAT)

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

FIRST AID PROC:EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MD ATTN. INGEST:IF VICTIM IS CONSCIOUS, IMMED GIVE 2-4 GLASSES OF WATER. INDUCE VOMIT BY TOUCHING FINGER TO BACK OF THROAT. GET MD ATTN IMMED. DO NOT INDUCE VOMIT. GET IMMED MEDICAL ATTN. OTHER PROT EQUIP:AN EYE-WASH FOUNTAIN WITHIN WORK AREA FOR EMERG.

===== Physical/Chemical Properties =====

HCC:N1

Spec Gravity:2.0 @ 64F

Solubility in Water:0.4% @ 50F

Appearance and Odor:COLORLESS CRYSTALS/WHITE, CRYSTALLINE POWDER W/ PLEASANT ACIDULOUS TASTE

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

NONE KNOWN

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:BY COMBUST MAY YIELD:CO, CO2. THIS GASEOUS MIX IS TOX & REACTIVE. A CAUSTIC POTASH RESIDUE WOULD ALSO BE FORMED.

===== Disposal Considerations =====

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Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE WITH LOCAL, STATE
AND FEDERAL REGULATIONS .

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particular situation.

Material Safety Data Sheet

Potassium bromide

ACC# 19280

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium bromide

Catalog Numbers: AC196480000, AC196480010, AC206390000, AC206391000, AC222550000, AC222551000, AC222555000, AC423010000, AC423011000, AC424070000, AC424070025, AC424070050, 42407-5000, P205-3, P205-500, P227-25

Synonyms: Hydrobromic acid potassium salt; Bromide salt of potassium.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7758-02-3	Potassium bromide	>98	231-830-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Causes eye irritation. Possible risk of harm to the unborn child. May cause central nervous system effects. Hygroscopic (absorbs moisture from the air).

Target Organs: Central nervous system, eyes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: May cause skin irritation. Exposure to bromides may cause rashes, especially of the face (resembling acne) and boils.

Ingestion: May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness,

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coma and possible death due to respiratory failure.

Inhalation: Inhalation of bromides may cause irritation of the upper respiratory tract and lung tissue.

Chronic: Chronic ingestion may cause bromism characterized by disturbances of the central nervous system, skin and digestive tract. Repeated oral intake of bromides (>9 mg/kg/day) may affect the central nervous system. Warning symptoms include mental dullness, slurred speech, weakened memory, apathy, anorexia, constipation, drowsiness and loss of sensitivity to touch and pain.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for 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. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

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Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry place. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium bromide	none listed	none listed	none listed

OSHA Vacated PELs: Potassium bromide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: Neutral in solution.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: 1435 deg C

Freezing/Melting Point: 730 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 2.75

Molecular Formula: KBr

Molecular Weight: 119

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Dust generation, moisture.

Incompatibilities with Other Materials: Strong acids.

Hazardous Decomposition Products: Hydrogen bromide, oxides of potassium.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7758-02-3: TS7650000

LD50/LC50:

CAS# 7758-02-3:

Oral, mouse: LD50 = 3120 mg/kg;

Oral, rat: LD50 = 3070 mg/kg;

Carcinogenicity:

CAS# 7758-02-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Two children born to a woman who ingested large amounts of bromides throughout both pregnancies had heights and head circumferences below the 5th percentile and a two year lag in bone ages when they were 7 and 8 years old (Opitz et al, 1972).

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and

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accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-02-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7758-02-3: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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

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CAS# 7758-02-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

WGK (Water Danger/Protection)

CAS# 7758-02-3: 1

Canada - DSL/NDSL

CAS# 7758-02-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7758-02-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 7/09/1998

Revision #7 Date: 8/25/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Potassium chlorate

ACC# 19300

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium chlorate

Catalog Numbers: AC208860000, AC208860010, AC208860050, AC418190000, AC418190050, AC418195000, P210-500, P212-100, P212-500

Synonyms: Berthollet's Salt; Salt of Tarter; Chlorate of Potash; Chloric Acid, Potassium Salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
3811-04-9	Potassium chlorate	99-100	223-289-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Danger! Explosive when mixed with combustible material. Strong oxidizer. Contact with other material may cause a fire. May cause severe eye, skin and respiratory tract irritation with possible burns. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May be harmful if swallowed. May cause blood abnormalities. May cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). May cause kidney damage.

Target Organs: Blood, kidneys.

Potential Health Effects

Eye: May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause severe irritation and possible burns.

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Ingestion: May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, and death. Methemoglobinemia is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood. May cause burns to the gastrointestinal tract. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: Dust is irritating to the respiratory tract. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause methemoglobinemia, which is characterized by chocolate-brown colored blood, headache, weakness, dizziness, breath shortness, cyanosis (bluish skin due to deficient oxygenation of blood), rapid heart rate, unconsciousness and possible death.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation.

Notes to Physician: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood.

Antidote: Methylene blue, alone or in combination with oxygen is indicated as a treatment in nitrite induced methemoglobinemia.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Use water spray to keep fire-exposed containers cool. Use water with caution and in flooding amounts. Some oxidizers may react explosively with hydrocarbons(fuel). Containers may explode when heated.

Extinguishing Media: Contact professional fire-fighters immediately. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires, flood fire area with water from a distance. Contact with water or steam may produce toxic and flammable vapors.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool, dry place. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium chlorate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium chlorate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.

Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Section 9 - Physical and Chemical Properties

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Physical State: Solid
Appearance: white
Odor: odorless
pH: Not available.
Vapor Pressure: Not applicable.
Vapor Density: Not applicable.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: Not applicable.
Freezing/Melting Point: 356 deg C
Decomposition Temperature: 400 deg C
Solubility: Not available.
Specific Gravity/Density: 2.52
Molecular Formula: KClO₃
Molecular Weight: 122.5495

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, dust generation, combustible materials, reducing agents.
Incompatibilities with Other Materials: Reducing agents.
Hazardous Decomposition Products: Chlorine, chlorine, oxygen, oxides of potassium.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 3811-04-9: FO0350000
LD50/LC50:
CAS# 3811-04-9:
Oral, rat: LD50 = 1870 mg/kg;

Carcinogenicity:
CAS# 3811-04-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

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Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Harmful to aquatic environments.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	POTASSIUM CHLORATE	POTASSIUM CHLORATE
Hazard Class:	5.1	5.1
UN Number:	UN1485	UN1485
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 3811-04-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

Material Safety Data Sheets, Carver Hall RM 208-A

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 # 3811-04-9: immediate, delayed, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 3811-04-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O N

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 9 Explosive when mixed with combustible material.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 13 Keep away from food, drink and animal feeding stuffs.

S 16 Keep away from sources of ignition - No smoking.

S 27 Take off immediately all contaminated clothing.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 3811-04-9: 2

Canada - DSL/NDSL

CAS# 3811-04-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997

Revision #6 Date: 11/20/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Potassium chloride

ACC# 19310

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium chloride

Catalog Numbers: AC193780000, AC193780010, AC193780050, AC196770000, AC196770010, AC424090000, AC424090030, AC424090250, S77375, S77375-1, S77375-2, S79807, 42409-0010, BP366-1, BP366-500, NC9545334, P217-10, P217-250LB, P217-3, P217-500, P217-500LC, P330-250LB, P330-3, P330-500, P333-250LB, P333-3, P333-500, P335-12, P335-212, P335-SAM1, P33512LC

Synonyms: KCl.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7447-40-7	Potassium chloride	99+	231-211-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause irritation of the digestive tract. Low hazard for usual industrial handling.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium chloride	none listed	none listed	none listed

OSHA Vacated PELs: Potassium chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1420 deg C @ 760 mmHg

Freezing/Melting Point: 770 deg C

Decomposition Temperature: Not available.

Solubility: 340 g/L (20°C)

Specific Gravity/Density: 1.987

Molecular Formula: KCl

Molecular Weight: 74.54

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

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Conditions to Avoid: Incompatible materials, dust generation, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Bromine trifluoride, strong oxidizing agents, strong acids, sulfuric acid, potassium permanganate.

Hazardous Decomposition Products: Hydrogen chloride, chlorine, carbon monoxide, carbon dioxide, potassium fume.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7447-40-7: TS8050000

LD50/LC50:

CAS# 7447-40-7:

Draize test, rabbit, eye: 500 mg/24H Mild;

Oral, mouse: LD50 = 1500 mg/kg;

Oral, rat: LD50 = 2600 mg/kg;

Carcinogenicity:

CAS# 7447-40-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: Unscheduled DNA Synthesis: Oral, rat = 1500 ug/kg.; Mutation in Microorganisms = Mouse, Lymphocyte = 2048 mg/L.; DNA Damage = Hamster, Ovary = 260 mmol/L.; Cytogenetic Analysis: Hamster, Lung = 12 gm/L.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and

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accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7447-40-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7447-40-7: immediate.

Section 313

This material contains Potassium chloride (listed as Water Dissociable Nitrate Compounds), 99+%, (CAS# 7447-40-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

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OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7447-40-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7447-40-7: 1

Canada - DSL/NDSL

CAS# 7447-40-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7447-40-7 is not listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 7/15/1999

Revision #8 Date: 10/10/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Potassium chromate

ACC# 19320

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium chromate

Catalog Numbers: AC202340000, AC202340050, AC202345000, P220-100, P220-3, P220-500, S71231

Synonyms: Chromic acid, dipotassium salt; Chromate of potassium; Neutral potassium chromate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7789-00-6	Chromic acid dipotassium salt	>99.5	232-140-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow solid.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye, skin, and respiratory tract irritation. Harmful if inhaled or swallowed. May cause allergic skin reaction. Cancer hazard. May be harmful if absorbed through the skin.

Target Organs: Kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities.

Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause dermatitis.

Ingestion: May cause severe and permanent damage to the digestive tract. May cause liver and kidney

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damage. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea.

Inhalation: May cause asthmatic attacks due to allergic sensitization of the respiratory tract. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. May cause severe irritation of the upper respiratory tract with pain, burns, and inflammation. Causes chemical burns to the respiratory tract. May cause chemical bronchitis with coughing and difficulty in breathing.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Prolonged or repeated exposure may lead to asthma and perforation of the nasal septum. Repeated inhalation may cause chronic bronchitis. May cause liver and kidney damage. May cause cancer in humans.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Containers may explode in the heat of a fire. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Do NOT use dry chemicals, CO₂, Halon or foams. Use water only in flooding quantities as fog.

Flash Point: Not available.

Autoignition Temperature: None reported.

Explosion Limits, Lower: None reported.

Upper: None reported.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills

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immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Use with adequate ventilation. Discard contaminated shoes.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromic acid dipotassium salt	0.05 mg/m ³ TWA (as Cr) (listed under Chromium (VI) compounds- water soluble).	0.001 mg/m ³ TWA (as Cr) (listed under Chromates). 15 mg/m ³ IDLH (as Cr(VI)) (listed under Chromates).	5 æg/m ³ TWA (listed under Chromium (VI) compounds). 0.1 mg/m ³ Ceiling (as CrO ₃ , applies to any operations or sectors for which the H exavalent Chromium standard [29 CFR 1910.1026] is stayed or is otherwise not in effect) (listed under Chromates). 2.5 æg/m ³ Action Level (as Cr.); 5 æg/m ³ TWA (as Cr, Cancer hazard - see 29 CFR 1910.1026) (listed under Chromium (VI) compounds).

OSHA Vacated PELs: Chromic acid dipotassium salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: yellow
Odor: odorless
pH: 8.6-9.8 (5% soln)
Vapor Pressure: 0
Vapor Density: Not applicable.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: Not available.
Freezing/Melting Point: 975 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: 2.7320
Molecular Formula: K₂CrO₄
Molecular Weight: 194.20

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Hydrazine, combustible, organic, or other readily oxidizable materials: paper, wood, sulfur, aluminum, plastics, chromic acid, chromates.
Hazardous Decomposition Products: Oxides of potassium, toxic chromium oxide fumes.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7789-00-6: GB2940000
LD50/LC50:
CAS# 7789-00-6:
Oral, mouse: LD50 = 180 mg/kg;

Carcinogenicity:
CAS# 7789-00-6:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Chromium (VI) compounds- water soluble').
- **California:** carcinogen, initial date 2/27/87 (listed as Chromium (VI) compounds).
- **NTP:** Known carcinogen (listed as Chromium (VI) compounds).

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- **IARC:** Group 1 carcinogen

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion.

Teratogenicity: TDLo (Intraperitoneal, mouse) = 30 mg/kg

Reproductive Effects: No information found

Mutagenicity: Mutation in microorganisms (*Salmonella typhimurium*) = 35 ug/plate
Mutation in microorganisms (*Salmonella typhimurium*) = 10 ug/plate

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. LC50 *Physa heterostropha* (snail) 31,600 ug/l as chromium; water hardness as 171 mg/l as calcium carbonate; static unmeasured method LC50 *Daphnia magna* (Cladoceran) 137,66.7 and 15.3 ug/l as chromium; water hardnesses of 212,188 and 50 as calcium carbonate, respectively, and with pH values of 8.2 to 8.4, 7.5 to 7.5 to 7.6, and 7.5, respectively; static measured method.

Environmental: Aquatic Fate: Cr(VI) exists in solution as hydrochromate, chromate, and dichromate ionic species. The proportion of each ion in solution is dependent on pH. In strongly basic and neutral pHs, the chromate form predominates. Chromium is present usually as Cr(III) in the soil and is characterized by its lack of mobility, except in cases where Cr(VI) is involved. Chromium (VI) of natural origin is rarely found.

Physical: As the pH is lowered, the hydrochromate concentration increases. At very low pHs, the dichromate species predominates. In the pH ranges encountered in natural water, the predominant forms are hydrochromate ions (63.6%) at pH 6.0 to 6.2 and chromate ion (95.7%) at pH 7.8 to 8.5. The oxidizing ability of Cr(VI) in aqueous solution is pH dependent.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

US DOT

Canada TDG

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Shipping Name:	OXIDIZING SOLID, TOXIC, N.O.S.	Oxidizing Solid, Toxic, N.O.S. (POTASSIUM CHROMATE)
Hazard Class:	5.1	5.1
UN Number:	UN3087	UN3087
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7789-00-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 7789-00-6: Section 6, 0.1 % de minimus concentration [see 40 CFR 749.68]

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7789-00-6: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7789-00-6: immediate, delayed.

Section 313

This material contains Chromic acid dipotassium salt (listed as Chromium (VI) compounds), >99.5%, (CAS# 7789-00-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7789-00-6 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7789-00-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Chromium (VI) compounds- water soluble), Minnesota, (listed as Chromium (VI) compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

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WARNING: This product contains Chromic acid dipotassium salt, listed as 'Chromium (VI) compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T O N

Risk Phrases:

R 22 Harmful if swallowed.

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 43 May cause sensitization by skin contact.

R 46 May cause heritable genetic damage.

R 8 Contact with combustible material may cause fire.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7789-00-6: 2

Canada - DSL/NDSL

CAS# 7789-00-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2A, D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7789-00-6 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium dichromate

ACC# 19370

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium dichromate

Catalog Numbers: AC196590000, AC196590020, AC196590500, AC196595000, AC197760000, AC197760010, AC197765000, AC325590000, AC424110000, AC424110050, AC424110500, AC424115000, AC9521839, AC9654808, S77435, S77435-1, S77435-2, S93333, P186-3, P186-500, P188-100, P188-3, P188-30, P188-500

Synonyms: Dichromic acid, dipotassium salt; Dipotassium dichromate; Potassium bichromate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-50-9	Chromic acid, dipotassium salt	100	231-906-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange crystalline powder.

Danger! Danger of serious damage to health by prolonged exposure through inhalation. May be fatal if inhaled or swallowed. Strong oxidizer. Contact with other material may cause a fire. Causes burns by all exposure routes. May cause allergic respiratory and skin reaction. May impair fertility. May cause harm to the unborn child. Harmful if absorbed through the skin. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause heritable genetic damage. May cause sensitization by inhalation and by skin contact.

Target Organs: Blood, kidneys, liver, lungs, respiratory system, gastrointestinal system, teeth, eyes, skin.

Material Safety Data Sheets, Carver Hall RM 208-A

Potential Health Effects

Eye: Causes eye burns.

Skin: Harmful if absorbed through the skin. Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: May be fatal if swallowed. Causes gastrointestinal tract burns. May cause kidney damage. May cause perforation of the digestive tract.

Inhalation: May be fatal if inhaled. May cause allergic respiratory reaction. May cause liver and kidney damage. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities.

Chronic: Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. May cause respiratory tract cancer. May cause liver and kidney damage. May cause cancer in humans. Laboratory experiments have resulted in mutagenic effects. Possible risk of harm to the unborn child. Repeated or prolonged exposure may cause erosion and discoloration of the teeth. May impair fertility.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Call a poison control center.

Inhalation: If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Containers may explode if exposed to fire.

Extinguishing Media: Use water only! Do NOT use dry chemical. Do NOT use halocarbons and sodium bicarbonate. Do NOT use carbon dioxide or dry chemical. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 4; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Carefully scoop up and place into appropriate disposal container. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Use only in a chemical fume hood. Discard contaminated shoes.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chromic acid, dipotassium salt	0.05 mg/m ³ TWA (as Cr) (listed under Chromium (VI) compounds- water soluble).	0.001 mg/m ³ TWA (as Cr) (listed under Chromates). 15 mg/m ³ IDLH (as Cr(VI)) (listed under Chromates).	5 æg/m ³ TWA (listed under Chromium (VI) compounds). 0.1 mg/m ³ Ceiling (as CrO ₃ , applies to any operations or sectors for which the H exavalent Chromium standard [29 CFR 1910.1026] is stayed or is otherwise not in effect) (listed under Chromates). 2.5 æg/m ³ Action Level (as Cr.); 5 æg/m ³ TWA (as Cr. Cancer hazard - See 29 CFR 1910.1026) (listed under Chromium (VI) compounds).

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OSHA Vacated PELs: Chromic acid, dipotassium salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: orange

Odor: odorless

pH: 4 (5% aq. solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 500 deg C

Freezing/Melting Point: 398 deg C

Decomposition Temperature: 500 deg C

Solubility: 125 g/L (20°C)

Specific Gravity/Density: 2.676

Molecular Formula: K₂Cr₂O₇

Molecular Weight: 294.18

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, combustible materials, organic materials.

Incompatibilities with Other Materials: Reducing agents, acids, strong bases, acetic anhydride, hydrazine, hydroxylamine, nitric acid, oils, hydrochloric acid.

Hazardous Decomposition Products: Oxygen, oxides of potassium, chromium dioxide, toxic chromium oxide fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

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RTECS#:

CAS# 7778-50-9: HX7680000

LD50/LC50:

CAS# 7778-50-9:

Draize test, rabbit, eye: 140 mg Severe;

Oral, mouse: LD50 = 190 mg/kg;

Oral, rat: LD50 = 25 mg/kg;

Skin, rabbit: LD50 = 14 mg/kg;

Inhalation LC50 (rat): 0.094 mg/l/4H (Merck).

Carcinogenicity:

CAS# 7778-50-9:

- **ACGIH:** A1 - Confirmed Human Carcinogen (listed as 'Chromium (VI) compounds- water soluble').
- **California:** carcinogen, initial date 2/27/87 (listed as Chromium (VI) compounds).
- **NTP:** Known carcinogen (listed as Chromium (VI) compounds).
- **IARC:** Group 1 carcinogen

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals.

Teratogenicity: Oral, rat: TDLo = 1 gm/kg (female 0-19 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system.; Oral, mouse: TDLo = 1 gm/kg (female 20 day(s) pre-mating) Effects on Embryo or Fetus - extra-embryonic structures (e.g., placenta, umbilical cord) and Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus).

Reproductive Effects: Oral, rat: TDLo = 525 mg/kg (female 21 day(s) after conception) Fertility - pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea) and Fertility - post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).

Mutagenicity: Micronucleus Test: Human, Lymphocyte = 300 ug/L.; Morphological Transformation: Human, Fibroblast = 200 nmol/L.; DNA Damage: Human, Fibroblast = 500 nmol/L.; Unscheduled DNA Synthesis: Human, Fibroblast = 50 umol/L.; DNA Inhibition: Human, Fibroblast = 100 umol/L.; DNA Inhibition: Human, HeLa cell = 13 umol/L.; Mutation Test Systems - not otherwise specified: Human, Fibroblast = 100 umol/L.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Striped bass: LC50 = 75 mg/L; 96 Hr; Static bioassay Fish: Fathead Minnow: LC50 = 17,300 ug/L; Unspecified; as chromium (Unspecified) Fish: Bluegill/Sunfish: LC50 = 118,000-133,000 ug/L; Unspecified; as chromium (Static unmeasured) Water flea Daphnia: EC50 = 1,570 ug/L; 24 Hr; as chromium (Unspecified) Chromium probably occurs as the insoluble Cr(III) oxide (Cr₂O₃.nH₂O) in soil, as the organic matter in soil is expected to reduce any soluble chromate to insoluble chromic oxide (Cr₂O₃). Chromium in soil can be transported to the atmosphere by way of aerosol formation. Chromium is also transported from soil through runoff and leaching of water.

Environmental: Most of the chromium in surface waters may be present in particulate form as sediment. Some of the particulate chromium would remain as suspended matter and ultimately be deposited in sediments. Chromium is present usually as Cr(III) in the soil and is characterized by its lack of mobility, except in cases where Cr(VI) is involved. Chromium(VI) of natural origin is rarely found.

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Physical: No information available.

Other: Dangerous to aquatic life in high concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, OXIDIZING, N.O.S.	TOXIC SOLIDS, OXIDIZING, N.O.S.
Hazard Class:	6.1	6.1
UN Number:	UN3086	UN3086
Packing Group:	I	I

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-50-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 7778-50-9: Section 6, 0.1 % de minimus concentration [see 40 CFR 749.68]

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7778-50-9: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7778-50-9: delayed.

Section 313

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This material contains Chromic acid, dipotassium salt (listed as Chromium (VI) compounds), 100%, (CAS# 7778-50-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7778-50-9 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-50-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Chromium (VI) compounds- water soluble), Minnesota, (listed as Chromium (VI) compounds), Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chromic acid, dipotassium salt, listed as 'Chromium (VI) compounds', a chemical known to the state of California to cause cancer.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T+ O N

Risk Phrases:

R 21 Harmful in contact with skin.

R 25 Toxic if swallowed.

R 26 Very toxic by inhalation.

R 34 Causes burns.

R 42/43 May cause sensitization by inhalation and skin contact.

R 45 May cause cancer.

R 46 May cause heritable genetic damage.

R 8 Contact with combustible material may cause fire.

R 48/23 Toxic : danger of serious damage to health by prolonged exposure through inhalation.

R 60 May impair fertility.

R 61 May cause harm to the unborn child.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

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WGK (Water Danger/Protection)

CAS# 7778-50-9: 3

Canada - DSL/NDSL

CAS# 7778-50-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D1A, D2A, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7778-50-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 7/19/1999

Revision #6 Date: 6/18/2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

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E M SCIENCE DIV OF E M IND INC -- POTASSIUM DIHYDROGEN PHOSPHATE -- 6850-00F034377

===== Product Identification =====

Product ID:POTASSIUM DIHYDROGEN PHOSPHATE
MSDS Date:05/01/1993
FSC:6850
NIIN:00F034377
MSDS Number: BTNLQ
=== Responsible Party ===
Company Name:E M SCIENCE DIV OF E M IND INC
Address:480 DEMOCRAT RD
Box:70
City:GIBBSTOWN
State:NJ
ZIP:08027
Country:US
Info Phone Num:513-631-0445/609-354-9200
Emergency Phone Num:800-424-9300/609-354-9200
CAGE:63612

===== Contractor Identification =====

Company Name:E M SCIENCE DIV OF E M INDUSTRIES INC
Address:480 DEMOCRAT ROAD
Box:70
City:GIBBSTOWN
State:NJ
ZIP:08027
Country:US
Phone:800-222-0342/609-423-6300
CAGE:63612

===== Composition/Information on Ingredients =====

Ingred Name:POTASSIUM PHOSPHATE (MONOBASIC) *93-4*
CAS:7778-77-0
Fraction by Wt: 100%

===== 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:EYES: IRRITATION. SKIN: IRRITATION,
ALLERGIC REACTION.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION

===== First Aid Measures =====

First Aid:SKIN: WASH THOROUGHLY W/SOAP& WATER. EYES: FLUSH W/WATER FOR
15 MINS. INHALATION: REMOVE TO FRESH AIR. GIVE CPR IF BREATHING HAS
STOPPED. INGESTION: IF CONSCIOUS, GIVE WATER FREELY. OBTAIN MEDICAL
ATTENTION IN ALL CASES.

===== Fire Fighting Measures =====

Extinguishing Media:USE ANY SUITABLE FOR ADJACENT MATERIAL.
Fire Fighting Procedures:WEAR SELF-CONTAINED BREATHING APPARATUS.

===== Accidental Release Measures =====

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Spill Release Procedures:EVACUATE AREA. WEAR PROPER PROTECTIVE EQUIPMENT. ELIMINATE ANY IGNITION SOURCES. CONTAIN THE RELEASE & ELIMINATE ITS SOURCE W/OUT RISK. TAKE UP & CONTAINERIZE.

===== Handling and Storage =====

Handling and Storage Precautions:KEEP CONTAINER CLOSED & STORE AT CONTROLLED ROOM TEMP. DON'T BREATH DUST/GET INTO EYES. AVOID PROLONGED/REPEATED SKIN CONTACT.

Other Precautions:KEEP FROM IGNITION SOURCES. DON'T TAKE INTERNALLY. HYGROSCOPIC.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:SUITABLE PROTECTIVE W/FUME HOOD.

Ventilation:APPROVED HOOD/ADEQUATE VENTILATION

Protective Gloves:BUTYL/NATURAL RUBBER/NEOPRENE

Eye Protection:SAFETY GLASSES W/SIDE SHIELDS

Other Protective Equipment:EYE WASH, POLYVINYL CHLORINATED GLOVES

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health

===== Physical/Chemical Properties =====

Decomp Temp:Decomp Text:752F

Spec Gravity:2.34

Solubility in Water:18%

Appearance and Odor:WHITE CRYSTALS/POWDER, ODORLESS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

Stability Condition to Avoid:IGNITION SOURCES

===== Disposal Considerations =====

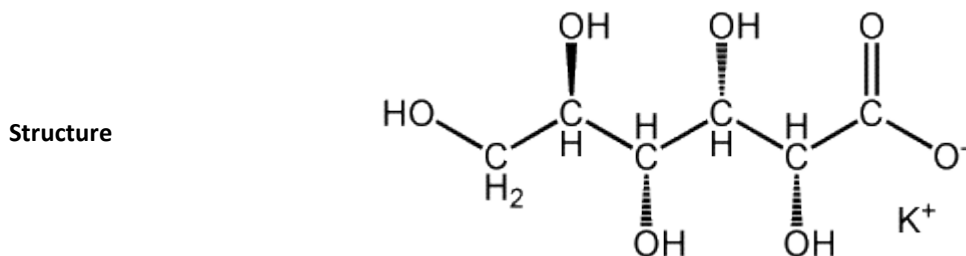
Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.

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Potassium gluconate

- D-Gluconic acid, monopotassium salt
- Gluconic acid potassium salt
- Gluconsan K
- Kalium gluconate
- Potasoral
- Sirokal

Formula $C_6H_{11}KO_7$



Description Odorless white or yellow crystals.

Uses Major uses include medication.

Registry Numbers and Inventories.

CAS	299-27-4
NIH PubChem CID	16760467
EC (EINECS/ELINCS)	206-074-2
RTECS	LZ5230000
RTECS class	Drug
Merck	12,7796
Beilstein/Gmelin	3919448
Beilstein Reference	4-03-00-01255

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Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Korea ECL	Listed
Philippiens PICCS	Listed

Properties.

Formula	C ₆ H ₁₁ KO ₇
Formula mass	234.25
Melting point, °C	174 - 176
Density	1.73 g/cm ³
Solubility in water	450 g/L (20 C)

Hazards and Protection.

Storage	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.

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Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
Small spills/leaks	Clean up spills immediately, using the appropriate protective equipment. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong oxidizing agents.
Decomposition	Carbon monoxide, carbon dioxide, oxides of potassium.

Fire.

Flash Point, °C 180

Autoignition, °C > 200

Fire fighting Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

NFPA	Health	1
	Flammability	1
	Reactivity	0

Health.

Exposure effects May contribute to alkalosis, an abnormal condition of increased alkalinity of the blood and tissues.

Ingestion May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. Ingestion of large amounts may cause nausea, vomiting, diarrhea, and abdominal discomfort.

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Inhalation	May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.
Skin	May cause skin irritation.
Eyes	May cause eye irritation.
First aid	
Ingestion	If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation	Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Skin	Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Eyes	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

HS Code

2918 16 00

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Potassium hydroxide

- Caustic potash
- Potassim hydrate
- Potassim hydrate
- Potassa
- Potassium lye

Formula	KOH
Structure	$K^+ OH^-$
Description	White flakes.
Uses	Ph adjustment, fungicide, herbicide, microbiocide.

Registry Numbers and Inventories.

CAS	1310-58-3
NIH PubChem CID	14797
EC (EINECS/ELINCS)	215-181-3
EC Index Number	019-002-00-8
EC Class	Xn; R22, C; R35
RTECS	TT2100000
RTECS class	Agricultural Chemical and Pesticide; Mutagen; Primary Irritant
UN (DOT)	1813
Merck	12,7806
Beilstein/Gmelin	19033 (G)
EPA OPP	75602

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Swiss Giftliste 1	G-4504
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	HKO
Formula mass	56.11
Melting point, °C	360
Boiling point, °C	1320
Vapor pressure, mm _{Hg}	1.0 (714 C)
Odor threshold	Odorless
Density	2.04 g/cm ³
Solubility in water	1100 g/L
Viscosity	1 cp (550 C)
Refractive index	1.409 - 1.411 (420 C)

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pKa/pKb	Strong base
Thermal expansion	0.00019/K
Heat of fusion	6.72 kJ/mol
Heat of vaporization	136.0 kJ/mol

Hazards and Protection.

Storage Store in a cool, dry place. Keep container closed when not in use. Store in a tightly closed container. Corrosives area.

WHMIS D1B E

Handling Wash thoroughly after handling. Do not allow water to get into the container because of violent reaction. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Use only in a chemical fume hood. Discard contaminated shoes.

Protection Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to 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. Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Small spills/leaks Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.

Stability Stable under normal shipping and handling conditions. Readily absorbs carbon dioxide and moisture from the air and deliquesces.

Incompatibilities Halogenated hydrocarbons - halogens - nitrocompounds - organic materials - acid chlorides - acid anhydrides - magnesium - copper - generates large amounts of heat when in contact with water and may steam and splatter. Reacts with chlorine dioxide, nitrobenzene, nitromethane, nitrogen

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trichloride, peroxidized tetrahydrofuran, 2,4,6-trinitrotoluene, bromoform+ crown ethers, acids alcohols, sugars, germanium cyclopentadiene, maleic dicarbide. Corrosive to metals such as aluminum, tin, and zinc to cause formation of flammable hydrogen gas, moisture.

Decomposition Oxides of potassium, hydrogen gas.

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. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Use water with caution and in flooding amounts. Contact with moisture or water may generate sufficient heat to ignite nearby combustible materials. Containers may explode when heated. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes. Extinguishing media: Use extinguishing media most appropriate for the surrounding fire. DO NOT USE WATER!

Fire potential Nonflammable.

Hazards Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.). Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated.

Combustion products Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

<u>NFPA</u>	Health	3
	Flammability	0
	Reactivity	1

Health.

Exposure limit(s) TLV: ppm; 2 mg/m³ (ceiling values) (ACGIH 1993-1994). NIOSH REL: TWA 2 mg/m³

Poison_Class 2

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Exposure effects	Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis. Effects may be delayed.
Ingestion	Harmful if swallowed. May cause severe and permanent damage to the digestive tract. May cause circulatory system failure. May cause perforation of the digestive tract. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause systemic effects.
Inhalation	Harmful if inhaled. 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. 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.
Skin	Causes skin burns. May cause deep, penetrating ulcers of the skin. Causes severe burns with delayed tissue destruction. Causes redness and pain. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.
Eyes	Causes severe eye burns. May cause irreversible eye injury. Contact may cause ulceration of the conjunctiva and cornea. Eye damage may be delayed. Causes redness and pain. May cause chemical conjunctivitis and corneal damage.
First aid	
Ingestion	Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation	Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Skin	Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Discard contaminated clothing in a manner which limits further exposure. Destroy contaminated shoes.
Eyes	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation is required (at least 30 minutes).

Transportation.

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UN number 1813

Response guide [154](#)

Hazard class 8



Packing Group II

USCG CHRIS Code CPS

[USCG Compatatibility Group](#) 5 Caustics

HS Code 2815 20 10

Std. Transport # 4932053

IMO Chemical Code 17

IMO Pollution Category C

IMO Hazard code S/P

Material Safety Data Sheet

Potassium iodide

ACC# 19435

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium iodide

Catalog Numbers: AC193790000, AC193790100, AC193790500, AC196730000, AC196730025, AC196735000, AC206470000, AC206471000, AC206475000, AC373650000, AC373651000, AC373655000, AC418260000, AC418261000, 41826-5000, BP367-500, NC9433542, P410-10, P410-100, P410-3, P410-500, P410J-500, P412-10, P412-3, P412-500

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-11-0	Potassium iodide	99.995	231-659-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! May cause eye, skin, and respiratory tract irritation. May cause reproductive and fetal effects.

Target Organs: Thyroid.

Potential Health Effects

Eye: Causes mild eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause allergic sensitization in certain individuals.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled. May cause respiratory

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sensitization.

Chronic: May cause reproductive and fetal effects. May interfere with iodine uptake of the thyroid gland and enlarge it. Some references (e.g. Dreisbach's Handbook) say that iodine and iodine compounds are potent sensitizers and that repeated contact may cause sensitivity dermatitis, laryngeal edema, serum sickness with lymph node enlargement, and joint pain and swelling.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with

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eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Do not store in direct sunlight. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium iodide	none listed	none listed	none listed

OSHA Vacated PELs: Potassium iodide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 7-9 (aq soln)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1330 deg C @ 760 mmHg

Freezing/Melting Point: 680 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 3.13

Molecular Formula: KI

Molecular Weight: 166

Section 10 - Stability and Reactivity

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Chemical Stability: Air sensitive. Moisture sensitive. Light sensitive.

Conditions to Avoid: Incompatible materials, light, dust generation, moisture, prolonged exposure to air.

Incompatibilities with Other Materials: Chloral hydrate, calomel, strong reducing agents, oxidizing agents, alkali metals, metals, metal salts, ozone, perchloryl fluoride, charcoal, bromine trifluoride, chlorine trifluoride.

Hazardous Decomposition Products: Hydrogen iodide, oxides of potassium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7681-11-0: TT2975000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7681-11-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Potassium iodide has been shown to produce fetotoxicity in newborns.

Teratogenicity: Teratogenic effects have occurred in humans.

Reproductive Effects: Adverse reproductive effects have occurred in humans.

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated.	Not regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-11-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7681-11-0: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7681-11-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

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California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7681-11-0: 1

Canada - DSL/NDSL

CAS# 7681-11-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7681-11-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium nitrate

ACC# 19470

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium nitrate

Catalog Numbers: AC193800000, AC193800100, AC193800500, AC193802500, AC205910000, AC205910010, AC205915000, AC424150000, AC424150050, AC424155000, 13620834, BP368-500, P261-3, P263-100, P263-3, P263-50, P263-500, P383-100, P383-500

Synonyms: Nitric acid potassium salt; Niter; 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
7757-79-1	Potassium nitrate	99+	231-818-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white.

Danger! Strong oxidizer. Contact with other material may cause a fire. Hygroscopic (absorbs moisture from the air).

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled. The toxicity of nitrates is due

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to their in-vivo conversion to nitrites which may lead to methemoglobinemia.

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. 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 available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; 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. Avoid generating dusty conditions. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation. Use with adequate ventilation. Keep from contact with clothing and other combustible

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materials.

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 adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium nitrate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium 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: Crystals

Appearance: white

Odor: odorless

pH: 6 - 8 (5% aq. sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 400 deg C @ 760 mmHg

Freezing/Melting Point: 334 deg C

Decomposition Temperature: > 400 deg C

Solubility: 320 g/L (20°C)

Specific Gravity/Density: 2.11

Molecular Formula: KNO₃

Molecular Weight: 101.1

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, combustible materials, organic materials, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, reducing agents, combustible and flammable materials (e.g. alkyl resins, asphalt, gasoline, grease, methyl acetone, polystyrene, polyurethane).

Hazardous Decomposition Products: Nitrogen oxides, oxygen.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7757-79-1: TT3700000

LD50/LC50:

CAS# 7757-79-1:

Oral, rabbit: LD50 = 1901 mg/kg;

Oral, rat: LD50 = 3750 mg/kg;

Oral, rat: LD50 = 3540 mg/kg;

Carcinogenicity:

CAS# 7757-79-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: See actual entry in RTECS for complete information.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: Nitrates are predominantly used as fertilizer. Unfortunately, nitrates have a tendency to migrate into groundwater as they do not bind to soil and are extremely soluble. Excessive levels of nitrates in drinking water may cause serious illness and death. Infants are most susceptible to nitrate toxicity. "Blue Baby Syndrome" can occur when the infant's conversion of nitrate to nitrite interferes with the oxygen-carrying capacity of the blood. Symptoms of Blue Baby Syndrome include, but may not be limited to, shortness of breath and bluish colored skin.

Physical: No information available.

Other: Do not empty into drains.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure 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 NITRATE	POTASSIUM NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1486	UN1486
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7757-79-1 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 # 7757-79-1: immediate, delayed, fire.

Section 313

This material contains Potassium nitrate (listed as Water Dissociable Nitrate Compounds), 99+%, (CAS# 7757-79-1) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Material Safety Data Sheets, Carver Hall RM 208-A

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depleters.
This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7757-79-1 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

○

Risk Phrases:

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.
S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7757-79-1: 1

Canada - DSL/NDSL

CAS# 7757-79-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7757-79-1 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium nitrite

ACC# 19480

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium nitrite

Catalog Numbers: AC222700000, AC222700010, AC222702500, AC423060000, AC423060050, AC423065000, P267-250, P267-500

Synonyms: Nitrous acid, potassium salt.

Company Identification:

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Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7758-09-0	Potassium nitrite	96+	231-832-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to pale yellow crystals.

Danger! Toxic if swallowed. Strong oxidizer. Contact with other material may cause a fire. Very toxic to aquatic organisms.

Target Organs: Blood, respiratory system, gastrointestinal system, eyes, ears.

Potential Health Effects

Eye: Causes eye irritation. Causes redness and pain.

Skin: Causes skin irritation. Causes redness and pain. May be harmful if absorbed through the skin.

Ingestion: Poison by ingestion. May cause headache. May cause nausea and vomiting. Overexposure may cause methemoglobinemia. Ingestion may cause a decrease in blood pressure, rapid pulse and visual disturbances.

Inhalation: Causes respiratory tract irritation. May cause effects similar to those described for ingestion.

Chronic: Absorption into the body leads to the formation of methemoglobin which in sufficient concentrations causes cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood).

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.

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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 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. Containers may explode in the heat of a fire. 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. Use flooding quantities of water as spray. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: Not applicable.

Autoignition Temperature: 510 deg C (950.00 deg F)

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. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Flush spill area with water. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get on skin or in eyes. Use only in a chemical fume hood. Keep from contact with clothing and other combustible materials. Do not breathe dust.

Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Material Safety Data Sheets, Carver Hall RM 208-A

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
Potassium nitrite	none listed	none listed	none listed

OSHA Vacated PELs: Potassium nitrite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate 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 pale yellow

Odor: odorless

pH: 7-10 (5% aq.sol.)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: 387 deg C

Decomposition Temperature: > 350 deg C

Solubility: 3000 g/l water (20°C)

Specific Gravity/Density: 1.9150

Molecular Formula: KNO₂

Molecular Weight: 85.10

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, excess heat, combustible materials, organic materials, exposure to moist air or water, temperatures above 300°C.

Incompatibilities with Other Materials: Acids, aluminum, amines, chlorates, finely powdered metals, hydrazine, permanganates, boron, amides, hypophosphites, sulfites, carbon, ammonium salts, iodides, mercury salts, cyanides.

Material Safety Data Sheets, Carver Hall RM 208-A

Hazardous Decomposition Products: Nitrogen oxides.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7758-09-0: TT3750000

LD50/LC50:

CAS# 7758-09-0:

Inhalation, mouse: LC50 = 85 gm/m³/2H;

Oral, rabbit: LD50 = 200 mg/kg;

Carcinogenicity:

CAS# 7758-09-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

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
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Material Safety Data Sheets, Carver Hall RM 208-A

Shipping Name:	POTASSIUM NITRITE	POTASSIUM NITRITE
Hazard Class:	5.1	5.1
UN Number:	UN1488	UN1488
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7758-09-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7758-09-0: 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# 7758-09-0 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:

T O N

Material Safety Data Sheets, Carver Hall RM 208-A

Risk Phrases:

- R 25 Toxic if swallowed.
- R 8 Contact with combustible material may cause fire.
- R 50 Very toxic to aquatic organisms.

Safety Phrases:

- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7758-09-0: 2

Canada - DSL/NDSL

CAS# 7758-09-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7758-09-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium oxalate monohydrate

ACC# 19494

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium oxalate monohydrate

Catalog Numbers: AC207710000, AC207710250, AC207715000, AC424020000, AC424025000, NC9337009, NC9567156, P273-250, P273-500

Synonyms: Oxalic acid, dipotassium salt, monohydrate; Ethanedioic acid, dipotassium salt, monohydrate; Dipotassium oxalate 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
6487-48-5	Potassium oxalate monohydrate	> 99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Warning! Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. Harmful if absorbed through the skin. May cause kidney damage. Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, heart, eyes, skin, brain, nerves, mucous membranes.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Harmful if absorbed through the 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

Material Safety Data Sheets, Carver Hall RM 208-A

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

Material Safety Data Sheets, Carver Hall RM 208-A

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid breathing dust.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Oxalates slowly corrode steel.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium oxalate monohydrate	none listed	none listed	none listed
Potassium oxalate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Potassium oxalate monohydrate: No OSHA Vacated PELs are listed for this chemical. Potassium 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: 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

Material Safety Data Sheets, Carver Hall RM 208-A

Physical State: Crystals
Appearance: white
Odor: odorless
pH: neutral in solution
Vapor Pressure: Negligible.
Vapor Density: Negligible.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 356 deg C
Decomposition Temperature: Not available.
Solubility: 364 g/L @ 20°C
Specific Gravity/Density: 2.13
Molecular Formula: C₂O₄K₂.H₂O
Molecular Weight: 184.24

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation, moisture, excess heat, Oxalates slowly corrode steel..
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, formic acid, dipotassium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 6487-48-5 unlisted.

CAS# 583-52-8: RO2885000

LD50/LC50:

Not available.

Not available.

CAS# 583-52-8: Woman LDLo - Oral: 1 gm/kg. Published data indicated arrhythmias including changes in conduction), shock, and gastrointestinal changes. Mean lethal dose for oxalates in adults is estimated at 10-30 grams (143-428 mg/kg).

Carcinogenicity:

CAS# 6487-48-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 583-52-8: 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 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

Material Safety Data Sheets, Carver Hall RM 208-A

0.2% oxalic acid in the drinking water.

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TOXIC SOLIDS, ORGANIC, N.O.S.	TOXIC SOLID, ORGANIC, NOS(Potassium oxal
Hazard Class:	6.1	6.1
UN Number:	UN2811	UN2811
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6487-48-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 583-52-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 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 # 6487-48-5: immediate, delayed.

CAS # 583-52-8: 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:

None of the chemicals in this 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# 6487-48-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 583-52-8 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 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# 6487-48-5: 1

CAS# 583-52-8: No information available.

Canada - DSL/NDSL

CAS# 583-52-8 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

Section 16 - Additional Information

Material Safety Data Sheet
Potassium periodate, p.a.

ACC# 96432

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium periodate, p.a.

Catalog Numbers: AC198390000, AC198390050, AC198391000, AC198395000

Synonyms: Potassium iodate

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7790-21-8	Potassium periodate, p.a.	100.0	232-196-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Danger! Oxidizer. Causes respiratory tract irritation. Causes eye and skin irritation. May cause digestive tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Causes skin irritation. Causes redness and pain.

Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May cause burns to the gastrointestinal tract. May cause nausea, vomiting, and diarrhea, possibly with blood.

Inhalation: Causes respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. Causes irritation of mucous membrane. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water with caution and in flooding amounts. Decomposes at high temperatures releasing oxygen which may cause an existing fire to burn more vigorously. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For small fires, do NOT use dry chemicals, carbon dioxide, halon or foams. USE WATER ONLY. For large fires flood fire with water from a distance.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid breathing dust, vapor, mist, or gas. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Avoid ingestion and inhalation.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents. Heat can cause thermal decomposition and pressure build-up inside containers. Keep containers tightly closed. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium periodate, p.a.	none listed	none listed	none listed

OSHA Vacated PELs: Potassium periodate, p.a.: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Negligible.

Vapor Density: Negligible.

Evaporation Rate: Negligible.

Viscosity: Not applicable.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: 582 deg C

Solubility: Soluble in water.

Specific Gravity/Density: 3.618 at 15C

Material Safety Data Sheets, Carver Hall RM 208-A

Molecular Formula: KIO₄

Molecular Weight: 230.0004

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials, ignition sources, dust generation, combustible materials, reducing agents, exposure to moist air or water.

Incompatibilities with Other Materials: Moisture.

Hazardous Decomposition Products: Hydrogen iodide, oxygen, oxides of potassium, iodide ions (I⁻).

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7790-21-8 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7790-21-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found.

Teratogenicity: No information found.

Reproductive Effects: No information found.

Mutagenicity: No information found.

Neurotoxicity: No information found.

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

Material Safety Data Sheets, Carver Hall RM 208-A

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	OXIDIZING SOLID, N.O.S.	OXIDIZING SOLID NOS (POTASSIUM PERIODATE)
Hazard Class:	5.1	5.1
UN Number:	UN1479	UN1479
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7790-21-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7790-21-8: acute, flammable, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Material Safety Data Sheets, Carver Hall RM 208-A

CAS# 7790-21-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI O

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 24/25 Avoid contact with skin and eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 7790-21-8: 1

Canada - DSL/NDSL

CAS# 7790-21-8 is listed on Canada's DSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

Material Safety Data Sheet
Potassium permanganate

ACC# 19520

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium permanganate

Catalog Numbers: AC196750000, AC196750010, AC196752500, AC207740000, AC207740010, AC207740250, AC218680000, AC218681000, AC424170000, AC424170250, 19675-0250, 19675-5000, 20774-5000, 42417-0025, 42417-5000, NC9368615, NC9667433, P279-212, P279-500, P287-212, P287-500

Synonyms: Permanganic acid, potassium salt; Permanganate of potash; Chameleon mineral.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7722-64-7	Potassium permanganate	>98	231-760-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: bronze crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes severe eye and skin irritation with possible burns. May be harmful if swallowed. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: Central nervous system, lungs, respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes severe eye irritation and possible burns. May cause chemical conjunctivitis and corneal damage. Recovery is usually complete, but in severe cases, permanent damage such as a dense, white cloudiness of the cornea may occur.

Material Safety Data Sheets, Carver Hall RM 208-A

Skin: Causes skin irritation and possible burns. Skin contact can cause brown stains in the area, and possible hardening of the outer skin layer.

Ingestion: May cause liver and kidney damage. May cause perforation of the digestive tract. May cause central nervous system effects. In high doses, manganese may increase anemia by interfering with iron absorption.

Inhalation: Causes respiratory tract irritation with possible burns. The lowest exposure concentration of manganese at which early effects on the CNS and the lungs may occur is still unknown. However, once neurological signs are present, they tend to continue and worsen after exposure ends. Extreme exposures could result in a build-up of fluid in the lungs (pulmonary edema) that might be fatal in severe cases.

Chronic: Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. Other chronic effects from inhaling high amounts of manganese include an increased incidence of cough and bronchitis and susceptibility to infectious lung disease.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse. NOTE: Contaminated clothing may be a fire hazard.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Strong oxidizer. Contact with other material may cause fire. Some oxidizers may react explosively with hydrocarbons(fuel). May accelerate burning if involved in a fire. Containers may explode when heated.

Extinguishing Media: Use large quantities of water. Do not use dry chemicals, CO₂, Halon or foams.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

Material Safety Data Sheets, Carver Hall RM 208-A

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep from contact with clothing and other combustible materials. Discard contaminated shoes. Do not breathe dust. Do not breathe spray or mist. Inform laundry personnel of contaminant's hazards.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Keep away from flammable liquids. Keep away from reducing agents. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium permanganate	0.2 mg/m ³ TWA (as Mn) (listed under Manganese, inorganic compounds).	1 mg/m ³ TWA (as Mn) (listed under Manganese compounds, n.o.s.).500 mg/m ³ IDLH (as Mn) (listed under Manganese compounds, n.o.s.).	5 mg/m ³ Ceiling (as Mn) (listed under Manganese compounds, n.o.s.).

OSHA Vacated PELs: Potassium permanganate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Appearance: dark purple - bronze
Odor: odorless
pH: 7-9 (20 g/l H₂O)
Vapor Pressure: Negligible
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not applicable.
Freezing/Melting Point: 240 deg C
Decomposition Temperature: 150 deg C
Solubility: 6.4 g/100 ml @ 20°C
Specific Gravity/Density: 2.700 g/cm³
Molecular Formula: KMnO₄
Molecular Weight: 158.03

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation, temperatures above 150°C.
Incompatibilities with Other Materials: Strong reducing agents, organic materials, arsenites, bromides, iodides, hydrochloric acid, charcoal, mercurous salts, hypophosphites, sulfites, alcohols, ferrous salts, strong acids, some metals, formaldehyde, metal powders, ethylene glycol, peroxides, combustible organics.
Hazardous Decomposition Products: Oxygen, oxides of potassium, oxides of manganese.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7722-64-7: SD6475000
LD50/LC50:

CAS# 7722-64-7:
Oral, mouse: LD50 = 2157 mg/kg;
Oral, mouse: LD50 = 750 mg/kg;
Oral, rat: LD50 = 750 mg/kg;

The estimated lethal human dose by ingestion is 10 grams, with death being delayed by up to one month:
Oral, rat: LD50 = 1090 mg/kg. Oral, human: LDLo = 143 mg/kg.

Carcinogenicity:

Material Safety Data Sheets, Carver Hall RM 208-A

CAS# 7722-64-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The U.S. EPA stated that epidemiological studies of inorganic manganese compounds in humans indicate effects on the respiratory system at levels below 1 mg/m³.

Teratogenicity: No information found

Reproductive Effects: Men exposed to manganese dusts showed a decrease in fertility.

Mutagenicity: Micronucleus Test: Oral, mouse = 205 mg/kg/24H (Continuous).; Cytogenetic Analysis: Oral, mouse = 718 mg/kg/7D (Continuous).; Cytogenetic Analysis: Mouse, Mammary gland = 1 mmol/L/48H.; Sperm Morphology: Oral, mouse = 513 mg/kg/5D (Continuous).

Neurotoxicity: Manganese is neurotoxic.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC50 = 0.75 mg/L; 96 Hr; UnspecifiedFish: Goldfish: LC50 = 3.6 mg/L; 24 Hr; UnspecifiedFish: Striped bass: LC50 = 1.5-5.0 mg/L; 24 Hr; Static bioassay No data available.

Environmental: No information available.

Physical: No information available.

Other: Harmful to aquatic life in very low concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	POTASSIUM PERMANGANATE	POTASSIUM PERMANGANATE
Hazard Class:	5.1	5.1
UN Number:	UN1490	UN1490
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7722-64-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7722-64-7: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7722-64-7: immediate, delayed, fire.

Section 313

This material contains Potassium permanganate (listed as Manganese compounds, n.o.s.), >98%, (CAS# 7722-64-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7722-64-7 (listed as Manganese compounds, n.o.s.) is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7722-64-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7722-64-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Manganese compounds, n.o.s.), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O N

Risk Phrases:

R 22 Harmful if swallowed.

R 8 Contact with combustible material may cause fire.

Material Safety Data Sheets, Carver Hall RM 208-A

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7722-64-7: 2

Canada - DSL/NDSL

CAS# 7722-64-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7722-64-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Potassium phosphate, monobasic

ACC# 19543

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium phosphate, monobasic

Catalog Numbers: AC205920000, AC205920025, AC205925000, AC271080000, AC271080025, AC424200000, AC424200250, AC424205000, BP362-1, BP362-500, NC9072700, NC9179992, P284-500, P285-10, P285-250LB, P285-3, P285-3LC, P285-50, P285-500, P286-1, P380-12, P380-212, P380-250LB, P380-500, P382-500, P386-500, P386SAM1, P386SAM2, P386SAM3

Synonyms: Dihydrogen potassium phosphate; Monopotassium phosphate; Phosphoric acid, monopotassium salt; Potassium dihydrogen phosphate; Potassium dihydrogen orthophosphate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-77-0	Potassium phosphate, monobasic	>99	231-913-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white crystals.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation. Low hazard for usual industrial handling.

Ingestion: May cause irritation of the digestive tract. Low hazard for usual industrial handling.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: May cause respiratory tract irritation.

Chronic: Ingestion of large doses may cause nausea, vomiting, diarrhea. Chronic exposure to this product may cause calcium phosphate deposition in the kidneys.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Persons with impaired kidney function may be more susceptible to the effects of this substance. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Wash thoroughly after handling. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid breathing dust, mist, or vapor. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium phosphate, monobasic	none listed	none listed	none listed

OSHA Vacated PELs: Potassium phosphate, monobasic: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: fine - colorless to white

Odor: Odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 252.6 deg C

Decomposition Temperature: > 253 deg C

Solubility: Soluble.

Specific Gravity/Density: 2.338 g/cm³

Material Safety Data Sheets, Carver Hall RM 208-A

Molecular Formula: KH₂PO₄

Molecular Weight: 136.08

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, moisture.

Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants..

Hazardous Decomposition Products: Oxides of phosphorus, irritating and toxic fumes and gases.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-77-0: TC6615500

LD50/LC50:

CAS# 7778-77-0:

Skin, rabbit: LD50 = >4640 mg/kg;

Carcinogenicity:

CAS# 7778-77-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: When too many nutrients such as phosphorus are in the water, algae grows maniacally. Algae blooms are followed by a die-off, and as material decays, it consumes oxygen like a forest fire. No fish, plants or insects can live in oxygen-free zones.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-77-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7778-77-0: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

Material Safety Data Sheets, Carver Hall RM 208-A

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-77-0 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7778-77-0: 1

Canada - DSL/NDSL

CAS# 7778-77-0 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet
Potassium sodium tartrate tetrahydrate

ACC# 21570

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium sodium tartrate tetrahydrate

Catalog Numbers: AC202860000, AC202860050, 20286-0010, 20286-5000, S386-12, S386-212, S386-500, S387-10, S387-3, S387-500

Synonyms: Sodium potassium tartrate tetrahydrate; Rochelle salt; Seignette salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6381-59-5	Tartrate, potassium sodium	>99	206-156-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Material Safety Data Sheets, Carver Hall RM 208-A

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tartrate, potassium sodium	none listed	none listed	none listed
Butanedioic acid, 2,3-dihydroxy-[R-(R*,R*)]-, monopotassium	none listed	none listed	none listed

OSHA Vacated PELs: Tartrate, potassium sodium: No OSHA Vacated PELs are listed for this chemical. Butanedioic acid, 2,3-dihydroxy-[R-(R*,R*)]-, monopotassium: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: none reported

pH: 5.5-8.5 (5% aq.sol. 20°C)

Vapor Pressure: Not available.

Vapor Density: Not applicable.

Evaporation Rate: Negligible

Viscosity: No data

Boiling Point: 220 deg C

Freezing/Melting Point: 70 - 80 deg C

Decomposition Temperature: 220 deg C

Solubility: 630 g/l (20°C)

Specific Gravity/Density: Not available.

Molecular Formula: NaKC4H4O6.4H2O

Molecular Weight: 282.22

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, sodium oxide, oxides of potassium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6381-59-5 unlisted.

CAS# 304-59-6 unlisted.

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 6381-59-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 304-59-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6381-59-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 304-59-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 6381-59-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6381-59-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 304-59-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

Material Safety Data Sheets, Carver Hall RM 208-A

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 6381-59-5: 0

CAS# 304-59-6: 1

Canada - DSL/NDSL

CAS# 304-59-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information

Material Safety Data Sheet

Potassium sulfate

ACC# 19590

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium sulfate

Catalog Numbers: AC205940000, AC205945000, AC207770000, AC207775000, AC424210000, AC424210010, AC424220000, AC424220010, AC424220250, NC9179989, P304-10, P304-3, P304-500, P305-500, P306-300LB

Synonyms: Dipotassium sulfate; Potassium sulfate (2:1); Sulfuric acid, dipotassium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7778-80-5	Potassium sulfate	>99	231-915-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Low hazard for usual industrial handling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Potassium sulfate has been used as a cathartic.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: Inhalation of dust may cause respiratory tract irritation.

Chronic: Not expected to be a chronic hazard.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for 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. Substance is noncombustible. Decomposes at high temperatures, resulting in toxic and corrosive products.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry place. Keep container closed when not in use.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Potassium sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Glove protection is not normally required.

Clothing: Protective garments not normally required.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Odorless

pH: ~ 7 (aq soln)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1689 deg C @ 760 mmHg

Freezing/Melting Point: 1067 deg C

Decomposition Temperature: Not available.

Solubility: 110 g/l (20°C)

Specific Gravity/Density: 2.66 g/cm³

Molecular Formula: K₂O₄S

Molecular Weight: 174.26

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation.

Material Safety Data Sheets, Carver Hall RM 208-A

Incompatibilities with Other Materials: No significant incompatibilities identified with common materials and contaminants..

Hazardous Decomposition Products: Oxides of sulfur, oxides of potassium.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7778-80-5: TT5900000

LD50/LC50:

CAS# 7778-80-5:

Oral, mouse: LD50 = 6600 mg/kg;

Oral, rat: LD50 = 6600 mg/kg;

Carcinogenicity:

CAS# 7778-80-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: This chemical has no biological oxygen demand, and it will not cause oxygen depletion in aquatic systems. It has a low potential to affect aquatic systems. If diluted with water, this chemical released directly or indirectly into the environment is not expected to have a significant impact.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7778-80-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7778-80-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

Material Safety Data Sheets, Carver Hall RM 208-A

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7778-80-5: 1

Canada - DSL/NDSL

CAS# 7778-80-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled..

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- REXYN 101 (H) RESEARCH GRADE -- 6810-00N059766

=====
Product Identification
=====

Product ID:REXYN 101 (H) RESEARCH GRADE

MSDS Date:12/30/1992

FSC:6810

NIIN:00N059766

MSDS Number: BXQVB

=== 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: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:SULFONATED COPOLYMER OF STYRENE AND DIVINYLBENZENE; (REXYN ION-EXCHANGE RESIN)

CAS:69011-20-7

Fraction by Wt: 100%

OSHA PEL:N/K

ACGIH TLV:N/K

Ingred Name:SUP DAT: TREAT SYMPTOMATICALLY & SUPPORTIVELY. GET MED ATTN. NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY & SUPPORTIVELY.
RTECS #:9999999ZZ

Ingred Name:RESP PROT: MUST BE BASED ON SPECIFIC OPERATION, MUST NOT EXCEED WORK LIM OF RESP & MUST BE JOINTLY APPRVD BY (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3: NIOSH/MSHA. ANY DUST MIST RESP. ANY AIR PURIFYING RESP W/HIGH-EFFICIENCY PARTICULATE FILTER. ANY POWERED (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4: AIR-PURIFYING RESP W/DUST & MIST FILTER. ANY POWERED AIR-PURIFYING RESP W/HIGH-EFFICIENCY PARTICULATE (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5: FILTER. ANY TYPE 'C' SUPP-AIR RESP OPERATED IN PRESS-DEMAND/OTHER POS PRESS/CONTINUOUS-FLOW MODE. ANY (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6: SCBA. FOR FIREFIGHT & OTHER IMMED DANGEROUS TO

Material Safety Data Sheets, Carver Hall RM 208-A

LIFE/HLTH CNDTNS: ANY SCBA THAT HAS FULL FACEPIECE & IS (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7: OPERATED IN PRESS-DEMAND/OTHER POS-PRESS MODE. ANY
SUPP-AIR RESP THAT HAS FULL FACEPIECE & IS OPERATED (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8: IN PRESS-DEMAND/OTHER POS-PRESS MODE IN COMBINATION
W/AUXILIARY SCBA OPERATED IN PRESS DEMAND/ (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9: OTHER POSITIVE-PRESSURE MODE.
RTECS #:9999999ZZ

===== Hazards Identification =====

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:NO Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE AND CHRONIC: NO DATA AVAILABLE.
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:SEE HEALTH HAZARDS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:INHAL: REMOVE TO FRESH AIR IMMED. IF BRTHG STOPPED, PERFORM
ARTF RESP. KEEP PERS WARM & AT REST. TREAT SYMPTOMATICALLY &
SUPPORTIVELY. GET MED ATTN IMMED. SKIN: REMOVE CONTAM CLTHG & SHOES
IMMED. WASH AFFECTED AREA W/SOAP/MILD DETERGENT & LGE AMTS OF
WATER UNTIL NO EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MED
ATTN IMMED. EYES: WASH IMMED W/LGE AMTS OF WATER/NORM SALINE,
OCCASNL (SUP DAT)

===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEM, CARBON DIOXIDE, WATER SPRAY/REGULAR FOAM
(1990 EMER RESPONSE GUIDEBOOK, DOT P 5800.5). FOR LARGER (SUP DAT)
Fire Fighting Procedures:WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT . MOVE CONTAINER FROM FIRE AREA IF POSSIBLE.
AVOID BREATHING VAPORS OR DUSTS. KEEP UPWIND.
Unusual Fire/Explosion Hazard:UNKNOWN.

===== Accidental Release Measures =====

Spill Release Procedures:OCCUPATIONAL SPILL: SCOOP UP AND PLACE IN A
SUITABLE CONTAINER.
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:THE FOLLOWING RESP ARE REC BASED ON INFO FOUND
IN PHYSICAL DATA, TOXICITY & HLTH EFTS SECTIONS. THEY ARE RANKED IN

Material Safety Data Sheets, Carver Hall RM 208-A

ORDER FROM MIN TO MAX RESP PROT. THE SPECIFIC RESP SELECTED MUST BE BASED ON CONTAM L LEVELS FOUND IN THE WORK PLACE, (ING 3)
Ventilation:PROVIDE LOCAL EXHAUST VENTILATION. VENTILATION EQUIPMENT MUST BE EXPLOSION-PROOF.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPRVD CHEM WORKERS GOGGS .

Other Protective Equipment:EMERGENCY EYEWASH & DELUGE SHOWER MEETING ANSI DESIGN CRITERIA .

Work Hygienic Practices:AVOID REPEATED AND PROLONGED CONTACT WITH THIS SUBSTANCE.

Supplemental Safety and Health

EXTING MEDIA:FIRES USE WATER SPRAY, FOG/REGULAR FOAM (1990 EMER RESPONSE GUIDEBOOK, DOT P 5800.5). FIRST AID PROC:LIFTING UPPER & LOWER LIDS, UNTIL NO EVIDENCE OF CHEM REMAINS (APPROX 15-20 MIN). GET MED ATTN IMMED. INGEST: DO NOT INDUCE VOMIT. IF VOMIT OCCURS, KEEP HEAD LOWER THAN HIPS TO HELP PREVENT ASPIR. (ING 2)

===== Physical/Chemical Properties =====

Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES

Spec Gravity:1.2

Evaporation Rate & Reference:1 (ETHER=1)

Solubility in Water:INSOLUBLE

Appearance and Odor:OPAQUE REDDISH-BROWN BEADS

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

NONE KNOWN.

Stability Condition to Avoid:STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY RELEASE TOXIC OXIDES OF SULFUR.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS .

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Material Safety Data Sheet

D-(-)-Ribose

ACC# 06173

Section 1 - Chemical Product and Company Identification

MSDS Name: D-(-)-Ribose

Catalog Numbers: BP696-25

Synonyms: Ribose.

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
50-69-1	D-(-)-Ribose	ca.100	200-059-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: None known.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: May cause skin irritation.

Ingestion: May cause irritation of the digestive tract. Low hazard for usual industrial handling.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Gently lift eyelids and flush continuously with water. If irritation develops, get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 0; 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: Provide ventilation. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
D-(-)-Ribose	none listed	none listed	none listed

OSHA Vacated PELs: D-(-)-Ribose: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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. Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: none reported

pH: acidic

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point:87 deg C

Decomposition Temperature:Not available.

Solubility: soluble in water.

Specific Gravity/Density:Not available.

Molecular Formula:C5H10O5

Molecular Weight:150.067

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, acrid smoke and fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 50-69-1: VJ2275000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 50-69-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

US DOT

Canada TDG

Material Safety Data Sheets, Carver Hall RM 208-A

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# 50-69-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 50-69-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Material Safety Data Sheets, Carver Hall RM 208-A

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 50-69-1: 0

Canada - DSL/NDSL

CAS# 50-69-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled. .

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sand

ACC# 09890

Section 1 - Chemical Product and Company Identification

MSDS Name: Sand

Catalog Numbers: AC370940000, AC370940010, AC370940050, AC370941000, AC393300000, AC393300010, AC393302500, S80156, S801561, S93346, S23-3, S23-50, S25-10, S25-3, S25-500

Synonyms: Quartz; Silicon dioxide; Silicon dioxide; Quartz; Sea Sand.

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
14808-60-7	Sand	100	238-878-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: light beige to gray powder.

Warning! Cancer hazard. May cause eye, skin, and respiratory tract irritation.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Dust may cause mechanical irritation.

Ingestion: May cause irritation of the digestive tract.

Inhalation: Dust is irritating to the respiratory tract.

Chronic: May cause cancer in humans. Prolonged exposure to respirable crystalline quartz may cause delayed lung injury/fibrosis (silicosis).

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: Material will not burn. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. 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

Material Safety Data Sheets, Carver Hall RM 208-A

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
Sand	0.025 mg/m ³ TWA (respirable fraction)	0.05 mg/m ³ TWA (respirable dust) 50 mg/m ³ IDLH (respirable dust)	none listed

OSHA Vacated PELs: Sand: 0.1 mg/m³ TWA (respirable dust)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: light beige to gray

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 2230 deg C

Freezing/Melting Point: 1610 deg C

Decomposition Temperature: Not available.

Solubility: Insoluble.

Specific Gravity/Density: 2.65

Molecular Formula: SiO₂

Molecular Weight: 60.08

Section 10 - Stability and Reactivity

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.

Material Safety Data Sheets, Carver Hall RM 208-A

Hazardous Decomposition Products: Oxides of silicon.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 14808-60-7: VV7330000

LD50/LC50:

Not available.

Human TCLo inhalation: 16 mppcf/8H/17.9Y intermittent. Toxic effects: fibrosis, pneumoconiosis, cough, difficult breathing.

Carcinogenicity:

CAS# 14808-60-7:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 10/1/88 (airborne particles of respirable size)
- **NTP:** Known carcinogen
- **IARC:** Group 1 carcinogen

Epidemiology: IARC Group 1: Proven human carcinogenic substance.

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in humans.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

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# 14808-60-7 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 # 14808-60-7: 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# 14808-60-7 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

Material Safety Data Sheets, Carver Hall RM 208-A

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Sand, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 14808-60-7: No information available.

Canada - DSL/NDSL

CAS# 14808-60-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 14808-60-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheets, Carver Hall RM 208-A

Silica gel

Formula $(\text{SiO}_2)_n \cdot x\text{H}_2\text{O}$

Structure $\left[\text{O}=\text{Si}=\text{O} \right]_x$

Description odorless white solid.

Uses An adsorbent consisting of amorphous silica produced by the reaction of sodium silicate with mineral acid.

Registry Numbers and Inventories.

CAS 63231-67-4

NIH PubChem CID 24261

EC (EINECS/ELINCS) 613-187-4

RTECS VV7340000

RTECS class Other

Beilstein/Gmelin NA

EPA OPP 72602

Canada DSL/NDSL DSL

US TSCA Listed

Australia AICS Listed

New Zealand Listed

Korea ECL Listed

Material Safety Data Sheets, Carver Hall RM 208-A

Philippiens PICCS

Listed

Properties.

Vapor density (air=1) N/R

Hazards and Protection.

Storage Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Handling Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Protection Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Small spills/leaks Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.

Stability Stable under normal shipping and handling conditions.

Incompatibilities Hydrofluoric acid.

Decomposition Silicon oxide.

Fire.

Fire fighting Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extinguishing media: Substance is

Material Safety Data Sheets, Carver Hall RM 208-A

nonflammable; use agent most appropriate to extinguish surrounding fire.

Fire potential Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

NFPA

Health	1
Flammability	0
Reactivity	0

Health.

Exposure effects

Ingestion May cause irritation of the digestive tract.

Inhalation May cause respiratory tract irritation.

Skin May cause skin irritation.

Eyes May cause eye irritation.

First aid

Ingestion If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation Remove from exposure to fresh air immediately. Get medical aid if cough or other symptoms appear.

Skin Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Eyes Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Material Safety Data Sheets, Carver Hall RM 208-A

Transportation.

USCG CHRIS Code

SLC

[USCG Compatatibility Group](#)

43 Misc. water solutions

IMO Pollution Category

[III]

Material Safety Data Sheet
Sodium sulfite, anhydrous

ACC# 21660

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium sulfite, anhydrous

Catalog Numbers: AC196630000, AC196630010, AC196630025, AC219270000, AC219270010, AC219270250, AC424430000, AC424430030, AC424432500, 42443-0010, BP355-500, S430-10, S430-3, S430-500, S447-3, S447-500

Synonyms: Sulfurous acid, disodium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7757-83-7	Sodium sulfite, anhydrous	97+	231-821-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine crystals.

Warning! Contact with acids liberates toxic gas. May cause eye, skin, and respiratory tract irritation.

Target Organs: None known.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do not induce vomiting. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep from contact with oxidizing materials. Keep away from strong acids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium sulfite, anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Sodium sulfite, anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white to light yellow - fine

Odor: odorless

pH: 8.5 - 10 (5% aq. sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: >500 deg C (decom)

Decomposition Temperature: Not available.

Solubility: 23 g/100 mL (20° C)

Specific Gravity/Density: 2.63

Molecular Formula: Na₂O₃S

Molecular Weight: 126.04

Section 10 - Stability and Reactivity

Chemical Stability: Contact with acid liberates gas. Air sensitive. Moisture sensitive.

Material Safety Data Sheets, Carver Hall RM 208-A

Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, sodium nitrate, sodium nitrite, sulfur dioxide.

Hazardous Decomposition Products: Oxides of sulfur, hydrogen sulfide, sodium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7757-83-7: WE2150000

LD50/LC50:

CAS# 7757-83-7:

Oral, mouse: LD50 = 820 mg/kg;

Oral, rat: LD50 = 3560 mg/kg;

Carcinogenicity:

CAS# 7757-83-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7757-83-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7757-83-7: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7757-83-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

Material Safety Data Sheets, Carver Hall RM 208-A

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

R 31 Contact with acids liberates toxic gas.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7757-83-7: 1

Canada - DSL/NDSL

CAS# 7757-83-7 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sodium Acetate, Anhydrous

ACC# 20860

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Acetate, Anhydrous

Catalog Numbers: AC149610000, AC149610010, AC149610025, AC220890000, AC220890010, AC220890050, AC220892500, AC327290000, AC327290010, AC419410000, AC419415000, AC424250000, AC424250050, 42425-5000, BP333-1, BP333-500, NC9599353, NC9714437, S210-2, S210-500

Synonyms: Acetic Acid, Sodium Salt; Sodium Acetate.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
127-09-3	Sodium acetate	100.0	204-823-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None known.

Potential Health Effects

Eye: May cause mild eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Get medical aid. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: None

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Flash Point: Not available.

Autoignition Temperature: 607 deg C (1,124.60 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and

Material Safety Data Sheets, Carver Hall RM 208-A

clothing. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Good general ventilation should be sufficient to control airborne levels. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium acetate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium acetate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless to slight acetic-like odor

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 324 deg C

Decomposition Temperature: Not available.

Solubility: 1190 g/l (20 C)

Specific Gravity/Density: Not available.

Molecular Formula: C₂H₃O₂Na

Molecular Weight: 82.03

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents. Explosive mixtures may be formed with fluorine or potassium nitrite.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 127-09-3: AJ4300010

LD50/LC50:

CAS# 127-09-3:

Draize test, rabbit, eye: 10 mg Mild;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = >30 gm/m³/1H;

Oral, mouse: LD50 = 6891 mg/kg;

Oral, rat: LD50 = 3530 mg/kg;

Skin, rabbit: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 127-09-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 5000 mg/L; 24 Hr.; Unspecified Water flea Daphnia: EC50 = 5800 mg/L; 48 Hr.; Unspecified Acute aquatic effects: 96-hour LC50 for fathead minnow: GT 100mg/L, 96-hour LC50 for water flea: GT 1000mg/L. This chemical has a low potential to affect aquatic organisms.

Environmental: This chemical is readily biodegradable and is not likely to bioconcentrate.

Physical: None.

Other: This chemical has a high biological oxygen demand, and it is expected to cause significant oxygen depletion in aquatic systems.

Section 13 - Disposal Considerations

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 127-09-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

Material Safety Data Sheets, Carver Hall RM 208-A

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 127-09-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 127-09-3: 1

Canada - DSL/NDSL

CAS# 127-09-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Section 16 - Additional Information

Material Safety Data Sheet

Sodium bicarbonate

ACC# 20970

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium bicarbonate

Catalog Numbers: AC123360000, AC123360010, AC123360050, AC217120000, AC217120010, AC217120025, AC217120250, AC217125000, AC424270000, AC424270010, AC424270250, BP328-1, BP328-500, NC9375816, NC9695834, S233-10, S233-3, S233-300LB, S233-50, S233-500, S2333LC, S631-10, S631-3, S631-50, S635-3, S637-12, S637-212, S637-212LC, S637-50

Synonyms: Baking soda; Sodium acid carbonate; Sodium hydrogen carbonate; Monosodium carbonate; Bicarbonate of soda.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
144-55-8	Sodium bicarbonate	99+	205-633-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Warning! Causes eye and skin irritation. May cause respiratory tract irritation.

Target Organs: Blood, kidneys, heart, liver, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: May be harmful if swallowed. Causes gastrointestinal tract irritation.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Material Safety Data Sheets, Carver Hall RM 208-A

Chronic: May cause liver and kidney damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause blood effects.

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.

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: 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
Sodium bicarbonate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium bicarbonate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: odorless

pH: 8.3 (0.1M aq.sol.)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:270 deg C

Decomposition Temperature:> 50 deg C

Solubility: 9 g/100mL (20°C)

Specific Gravity/Density:Not available.

Molecular Formula:CHNaO3

Molecular Weight:84.01

Section 10 - Stability and Reactivity

Chemical Stability: Decomposes when heated. May decompose on exposure to moist air or water.

Material Safety Data Sheets, Carver Hall RM 208-A

Conditions to Avoid: Incompatible materials, dust generation, excess heat, temperatures above 50°C (122°F), exposure to moist air or water.

Incompatibilities with Other Materials: Strong oxidizing agents, acids, monoammonium phosphate, sodium potassium alloys.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 144-55-8: VZ0950000

LD50/LC50:

CAS# 144-55-8:

Draize test, rabbit, eye: 100 mg/30S Mild;

Oral, mouse: LD50 = 3360 mg/kg;

Oral, rat: LD50 = 4220 mg/kg;

Carcinogenicity:

CAS# 144-55-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: No information available.

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: This chemical released into the environment is not expected to 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# 144-55-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 144-55-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

Material Safety Data Sheets, Carver Hall RM 208-A

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# 144-55-8: 0

Canada - DSL/NDSL

CAS# 144-55-8 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

Sodium metabisulfite

ACC# 21370

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium metabisulfite

Catalog Numbers: AC171490000, AC171490025, AC419580000, AC419580010, AC419580050, S242-12, S242-212, S242-400LB, S242-500, S243-10, S244-3, S244-500

Synonyms: Sodium pyrosulfite; Disodium disulfite; Pyrosulfurous acid, disodium salt; Disodium metabisulfite; Disodium pyrosulfite.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-57-4	Sodium metabisulfite	>97	231-673-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to yellow solid.

Danger! May cause allergic respiratory and skin reaction. May cause severe eye irritation and possible injury. May be harmful if swallowed. May cause skin and respiratory tract irritation. Contact with acids liberates toxic gas, sulfur dioxide. Slowly oxidized to the sulfate on exposure to air and moisture. Corrosive to aluminum in aqueous solution.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: May cause severe eye irritation and possible injury.

Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause an allergic reaction in certain individuals.

Material Safety Data Sheets, Carver Hall RM 208-A

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. Sulfite compounds may cause a severe allergic reaction in sensitive individuals and some asthmatics. Sodium metabisulfite used as a preservative in vinegar provoked severe asthma in a 67-year-old woman who ate salad with vinegar-based dressing. (ACGIH Documentation of the TLVs)

Inhalation: May cause allergic respiratory reaction. May cause effects similar to those described for ingestion. Inhalation of dust may cause respiratory tract irritation.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Use water fog, dry chemical, carbon dioxide, or regular foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Avoid breathing dust. Do not get in eyes. Avoid contact with skin and clothing.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Do not store in aluminum containers. Store protected from moisture. Keep away from oxidizing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium metabisulfite	5 mg/m ³ TWA	5 mg/m ³ TWA	none listed
Sulfur dioxide	2 ppm TWA; 5 ppm STEL	2 ppm TWA; 5 mg/m ³ TWA 100 ppm IDLH	5 ppm TWA; 13 mg/m ³ TWA

OSHA Vacated PELs: Sodium metabisulfite: 5 mg/m³ TWA Sulfur dioxide: 2 ppm TWA; 5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white to yellow

Odor: sulfur dioxide odor

pH: acid in soln

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 150 deg C

Decomposition Temperature: 150 deg C

Solubility: Soluble.

Specific Gravity/Density: 1.4

Molecular Formula: Na₂S₂O₅

Molecular Weight: 190.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Slowly oxidized to the sulfate on exposure to air and moisture.

Conditions to Avoid: Dust generation, moisture, exposure to air, excess heat, Corrosive to aluminum in aqueous solution..

Incompatibilities with Other Materials: Strong oxidizing agents, acids.

Hazardous Decomposition Products: Oxides of sulfur, toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7681-57-4: UX8225000

CAS# 7446-09-5: WS4550000

LD50/LC50:

CAS# 7681-57-4:

Dermal, guinea pig: LD50 = >1 gm/kg;

Draize test, rabbit, eye: 100 mg/24H Mild;

Draize test, rabbit, skin: 500 mg;

Oral, rat: LD50 = 1131 mg/kg;

Skin, rat: LD50 = >2 gm/kg;

CAS# 7446-09-5:

Draize test, rabbit, eye: 6 ppm/32D Mild;

Inhalation, mouse: LC50 = 3000 ppm/30M;

Inhalation, rat: LC50 = 2520 ppm/1H;

Inhalation, rat: LC50 = 2168 mg/m³;

Carcinogenicity:

CAS# 7681-57-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7446-09-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Two cases of occupational asthma in laundry workers exposed to sodium metabisulfite were reported. Sodium metabisulfite may be considered to be the anhydride of sodium bisulfite and is the

Material Safety Data Sheets, Carver Hall RM 208-A

chief constituent of commercial dry sodium bisulfite.

Teratogenicity: No information found

Reproductive Effects: See actual entry in RTECS for complete information.

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-57-4 is listed on the TSCA inventory.

CAS# 7446-09-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

CAS# 7446-09-5: 500 lb TPQ

SARA Codes

CAS # 7681-57-4: immediate.

CAS # 7446-09-5: immediate, sudden release of pressure.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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:

CAS# 7446-09-5 is considered highly hazardous by OSHA.

STATE

CAS# 7681-57-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7446-09-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 31 Contact with acids liberates toxic gas.

R 41 Risk of serious damage to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

S 46 If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 7681-57-4: 1

CAS# 7446-09-5: 1

Canada - DSL/NDSL

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CAS# 7681-57-4 is listed on Canada's DSL List.

CAS# 7446-09-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7681-57-4 is listed on the Canadian Ingredient Disclosure List.

CAS# 7446-09-5 is listed on the Canadian Ingredient Disclosure List.

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EMS CATALOG NO: 21130
EMS PRODUCT: Sodium Borate
DATE: 06/17/97
PAGE NUMBER: One of 5

MATERIAL SAFETY DATA SHEET

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

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FOR PRODUCT AND SALES INFORMATION

CONTACT ELECTRON MICROSCOPY SCIENCES OFFICE ABOVE.

PRODUCT IDENTIFICATION

PRODUCT NAME: Sodium Borate

SYNONYM/GENERIC ID:

Borax decahydrate, Sodium tetraborate decahydrate, sodium borate decahydrate, sodium pyroborate decahydrate

DOT HAZARD CLASSIFICATION: Not regulated

PIN (UN#/NA#): Not applicable

WHMIS CLASS: Class D Div 2 Sub A

FORMULA: Na₂B₄O₇·10H₂O

FORMULA WEIGHT: 381.37

CAS NUMBER: 1303-96-4

* * * EMS CATALOG NO: 21130 * * * (Page 2 of 5)

COMPONENTS

Material Safety Data Sheets, Carver Hall RM 208-A

INGREDIENTS % TLV HAZARD

Sodium Tetraborate >98 (TWA) 5 mg/m³ Poison
Decahydrate

PHYSICAL DATA

PHYSICAL STATE: Solid
VAPOR DENSITY: Not applicable
ODOR THRESHOLD: Not available
SPECIFIC GRAVITY: 1.73
FREEZING POINT: 62°C
SOLUBILITY IN H₂O: 5.8% (65.6%) @ 20°C (100°C)
BOILING POINT: Not applicable
COEFF. H₂O/OIL: Not applicable
VAPOR PRESSURE: Not applicable
PERCENT VOLATILE: Not applicable
EVAPORATION RATE: Not applicable
pH: 9.15-9.20 (0.01M, 20°C)
APPEARANCE/ODOR: White crystalline solid. Odorless.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (°C): Not applicable

FLAMMABLE LIMITS: LEL: Not applicable
UEL: Not applicable

AUTOIGNITION (°C): Not available
SENSITIVE TO IMPACT: No
SENSITIVE TO STATIC DISCHARGE: No

EXTINGUISHING MEDIA: Use extinguishing media appropriate to surrounding fire conditions.

HAZARDOUS COMBUSTION PRODUCTS: Oxide of sodium.

FIREFIGHTING PROCEDURES:

Wear adequate personal protection to prevent contact with material or its combustion products. Self contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode.

* * * EMS CATALOG NO: 21130 * * * (Page 3 of 5)

SPECIAL FIRE AND EXPLOSION HAZARDS:

Emits toxic fumes under fire conditions.

HEALTH HAZARD AND FIRST AID DATA

Material Safety Data Sheets, Carver Hall RM 208-A

PRIMARY ROUTE(S) OF ENTRY: Inhalation and ingestion. Eye contact.
Skin contact. Skin absorption.

EFFECTS OF ACUTE EXPOSURE:

Harmful by ingestion, inhalation or skin absorption. Irritant.

LC50: Not available

LD50: ORL-Rat 2660 mg/kg

EYES: Causes irritation.

SKIN: Causes skin irritation. May cause desquamation. Can be absorbed through damaged skin causing symptoms similar to ingestion.

INHALATION: Causes respiratory tract irritation. Irritating to the mucous membranes. See ingestion.

INGESTION:

Causes gastrointestinal irritation. May cause central nervous system depression, (headache, nausea, vomiting, dizziness, abdominal pain, etc...) diarrhea, oliguria, anuria, erythema, muscular rash, kidney damage, cardiovascular collapse, shock and death if ingested in large amounts. Toxic effects may be delayed.

EFFECTS OF CHRONIC OVEREXPOSURE:

May cause nose irritation, dyspnea, abdominal pain, reversible erythema and/or rash, central nervous system effects, dizziness, macular rash and lung damage. Animal studies show that ingestion of large amounts of borates over prolonged periods of time cause a decrease in sperm production and testicle size in male laboratory animals and developmental effects of fetuses of pregnant female laboratory animals.

TERATOGEN (yes); REPRODUCTIVE TOXIN (yes); Not fully investigated.

FIRST AID:

EYES: Wash eyes and skin with copious quantities of water for at least 15 minutes. Call a physician.

* * * EMS CATALOG NO: 21130 * * * (Page 4 of 5)

SKIN: Remove contaminated clothing. Wash skin with soap and water. Call a physician. Wash clothing before reuse.

INHALATION: Remove patient to fresh air. Administer artificial respiration or CPR if breathing has ceased. Call a physician.

INGESTION: Induce vomiting. Give large quantities of water or milk. Get immediate medical attention. Never give anything by mouth to an unconscious person.

REACTIVITY DATA

Material Safety Data Sheets, Carver Hall RM 208-A

HAZARDOUS POLYMERIZATION: Will not occur.

STABILITY: Stable.

INCOMPATIBILITY: Strong oxidizing agents, acids, metallic salts, alkaloids, zirconium.

REACTION PRODUCT(S): Not available

PREVENTATIVE MEASURES

PROTECTIVE EQUIPMENT TO BE USED:

RESPIRATORY PROTECTION:

Wear dust mask. If more than TLV, do not breathe vapor. Wear appropriate OSHA/MSHA approved chemical cartridge respirator.

VENTILATION: Adequate ventilation to maintain vapor/dust below TLV.

SKIN PROTECTION: Impervious gloves. Apron or clothing to protect skin. Sufficient to protect skin.

EYE PROTECTION: Safety goggles.

OTHER PROTECTIVE EQUIPMENT: Make eye bath and emergency shower available.

SPILLAGE OR LEAKS PROCEDURES:

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Wear self contained breathing apparatus, rubber boots and heavy rubber gloves. Sweep up and place in container for disposal. Avoid raising dust. Ventilate area and wash spill site after material pick up is complete.

* * * EMS CATALOG NO: 21130 * * * (Page 5 of 5)

WASTE DISPOSAL METHOD:

According to all applicable regulations. Avoid run off.

STORAGE AND HANDLING:

Store in a cool, dry area. Store in a well ventilated area. Store away from incompatible materials. Keep tightly closed. Do not add any other material to the container. Do not wash down the drain. Avoid raising dust. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption while handling.

SPECIAL PRECAUTIONS OR COMMENTS

Material Safety Data Sheets, Carver Hall RM 208-A

Teratogen!!! Reproductive Toxin!!! Irritant! Do not breathe dust. Avoid all contact with the product. Avoid prolonged or repeated exposure. Use adequate ventilation.

NOTES TO PHYSICIAN:

Gastric lavage with 5% sodium Bicarbonate is suggested. This should be followed by saline catharsis. Assure adequate hydration. Borax is not considered an acute poison. After ingestion or absorption into the bloodstream of large amounts (15 grams or more), symptoms may appear after 24-72 hours. Borates are readily dissipated through the urine (70% in the first 24 hours).

Material Safety Data Sheet
Sodium borohydride, powder

ACC# 21040

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium borohydride, powder

Catalog Numbers: S678-10, S678-25

Synonyms: Sodium tetrahydroborate; SBH.

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
16940-66-2	Sodium borohydride	>98	241-004-4

Hazard Symbols: T F

Risk Phrases: 15 25 34

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals. **Danger!** May cause severe eye and skin irritation with possible burns. May cause severe respiratory and digestive tract irritation with possible burns. May cause lung damage. Contact with water or steam may cause a fire/explosion hazard. Liberates flammable hydrogen gas. Water-reactive. May ignite or explode on contact with moist air. Reacts violently and/or explosively with water, steam or moisture. Hygroscopic (absorbs moisture from the air).

Target Organs: None known.

Potential Health Effects

Eye: May cause irreversible eye injury. When substance becomes wet or comes in contact with moisture of the mucous membranes, it will cause burns.

Skin: May be absorbed through the skin. May cause severe skin irritation with possible burns, especially if

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skin is wet or moist.

Ingestion: May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.

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. May cause lung damage.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. May cause lung damage.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. 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: 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. Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Water Reactive. Material will react with water and may release a flammable and/or toxic gas. Use water spray to keep fire-exposed containers cool. May ignite or explode on contact with steam or moist air. Containers may explode when heated.

Extinguishing Media: DO NOT USE WATER! Do NOT get water inside containers. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For small fires, use dry chemical, soda ash, lime or sand. For large fires, use dry sand, dry chemical, soda ash or lime or withdraw from area and let fire burn.

Flash Point: 250 deg C (482.00 deg F)

Autoignition Temperature: 400C (Dec)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 2; Special Hazard: -W-

Section 6 - Accidental Release Measures

Material Safety Data Sheets, Carver Hall RM 208-A

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation. Do not expose spill to water. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not allow water to get into the container because of violent reaction. Minimize dust generation and accumulation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium borohydride	none listed	none listed	none listed

OSHA Vacated PELs: Sodium borohydride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: white

Material Safety Data Sheets, Carver Hall RM 208-A

Odor: none reported
pH: alkaline in sol.
Vapor Pressure: Negligible.
Vapor Density: 1.3
Evaporation Rate: negligible
Viscosity: Not available.
Boiling Point: 400 deg C
Freezing/Melting Point: 37 deg C
Decomposition Temperature: > 400 deg C
Solubility: soluble & reactive in water
Specific Gravity/Density: 1.074
Molecular Formula: H₄BNa
Molecular Weight: 37.8278

Section 10 - Stability and Reactivity

Chemical Stability: Stable. However, may decompose if heated. May decompose on exposure to moist air or water. Combines vigorously or explosively with water.

Conditions to Avoid: Incompatible materials, moisture, contact with water, temperatures above 200°C, exposure to moist air or water.

Incompatibilities with Other Materials: Acids (mineral, non-oxidizing, e.g. hydrochloric acid, hydrofluoric acid, muriatic acid, phosphoric acid), acids (mineral, oxidizing, e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid), acids (organic, e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid), alcohols and glycols (e.g. butyl alcohol, ethanol, methanol, ethylene glycol), aldehydes (e.g. acetaldehyde, acrolein, chloral hydrate, formaldehyde), amides (e.g. butyramide, diethyltoluamide, dimethyl formamide), amines (aliphatic and aromatic, e.g. dimethyl amine, propylamine, pyridine, triethylamine), azo, diazo, and hydrazines (e.g. dimethyl hydrazine, hydrazine, methyl hydrazine), carbamates (e.g. carbanolate, carbofuran), caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), cyanides (e.g. potassium cyanide, sodium cyanide), dithiocarbamates (e.g. ferbam, maneb, metham, thiram), esters (e.g. butyl acetate, ethyl acetate, propyl formate), ethers.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, oxides of boron, borane, hydrogen gas.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 16940-66-2: ED3325000

LD50/LC50:

CAS# 16940-66-2:

Inhalation, rat: LC50 = 36 mg/m³;

Oral, mouse: LD50 = 50 mg/kg;

Oral, rabbit: LD50 = 50 mg/kg;

Oral, rat: LD50 = 162 mg/kg;

Skin, rabbit: LD50 = 230 mg/kg; <BR.

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Carcinogenicity:

CAS# 16940-66-2: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: See actual entry in RTECS for complete information.

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

Material Safety Data Sheets, Carver Hall RM 208-A

TSCA

CAS# 16940-66-2 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.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 16940-66-2: acute, flammable, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 16940-66-2 can be found on the following state right to know lists: New Jersey.
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T F

Risk Phrases:

R 15 Contact with water liberates extremely flammable gases.
R 25 Toxic if swallowed.
R 34 Causes burns.

Safety Phrases:

S 18 Handle and open container with care.
S 22 Do not breathe dust.

WGK (Water Danger/Protection)

CAS# 16940-66-2: 2

Canada - DSL/NDSL

CAS# 16940-66-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D2B.

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**Canadian Ingredient Disclosure List
Exposure Limits**

Material Safety Data Sheet

Sodium bromide

ACC# 21060

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium bromide

Catalog Numbers: AC205130000, AC205130010, AC205131000, AC246900000, AC246901000, AC246905000, S255-3, S255-500

Synonyms: Bromide salt of sodium.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7647-15-6	Sodium bromide	>99	231-599-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Caution! Causes mild eye irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: Central nervous system.

Potential Health Effects

Eye: Causes mild eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. Symptoms may include: headache, excitement, fatigue, nausea, vomiting, stupor, and coma. May be harmful if swallowed.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause respiratory tract irritation. May be

Material Safety Data Sheets, Carver Hall RM 208-A

harmful if inhaled.

Chronic: Chronic ingestion may cause central nervous system failure.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

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: 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. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium bromide	none listed	none listed	none listed

OSHA Vacated PELs: Sodium bromide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: not available

pH: 5-8.8 (5% aq soln)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: 1390 deg C @ 760 mmHg

Freezing/Melting Point: 755 deg C

Decomposition Temperature: 800 deg C

Solubility: 95g/100 ml water (25°C)

Specific Gravity/Density: 3.208

Molecular Formula: BrNa

Molecular Weight: 102.89

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Material Safety Data Sheets, Carver Hall RM 208-A

Conditions to Avoid: Incompatible materials, dust generation, heating to decomposition, exposure to moist air or water.

Incompatibilities with Other Materials: Strong acids, bromine trifluoride.

Hazardous Decomposition Products: Hydrogen bromide, sodium oxide, bromine fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7647-15-6: VZ3150000

LD50/LC50:

CAS# 7647-15-6:

Oral, mouse: LD50 = 7 gm/kg;

Oral, rat: LD50 = 3500 mg/kg;

Carcinogenicity:

CAS# 7647-15-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information found

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: >1000 mg/L; 96 h; LC50

Daphnia: Daphnia: >1000 mg/L; 48 h; LC50

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

Material Safety Data Sheets, Carver Hall RM 208-A

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7647-15-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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# 7647-15-6 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:

Material Safety Data Sheets, Carver Hall RM 208-A

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7647-15-6: 1

Canada - DSL/NDSL

CAS# 7647-15-6 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

CAS# 7647-15-6 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium carbonate

ACC# 21080

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium carbonate

Catalog Numbers: AC123670000, AC123670010, AC123670025, AC206800000, AC206800010, AC206800025, AC207760000, AC207765000, AC207810000, AC207810010, AC424280000, 42428-5000, BP357-1, NC9296359, NC9644731, S261-10, S263-1, S263-10, S263-3, S263-50, S263-500, S263-500LC, S263-50LC, S495-500

Synonyms: Crystal carbonate; Disodium carbonate; Sal soda; Soda ash; Washing soda; Soda, calcined.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

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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
497-19-8	Sodium carbonate anhydrous	100	207-838-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Warning! Harmful if inhaled. Causes eye and skin irritation. May cause respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: Eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Lachrymator (substance which increases the flow of tears).

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.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: Harmful if inhaled. May cause respiratory tract irritation.

Chronic: Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not 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. 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.

Material Safety Data Sheets, Carver Hall RM 208-A

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep away from acids. Do not get water inside containers.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium carbonate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Sodium carbonate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1600 deg C @ 760 mmHg

Freezing/Melting Point: 851 deg C

Decomposition Temperature: Not available.

Solubility: 22 g/100mL (20°C)

Specific Gravity/Density: 2.53

Molecular Formula: CNa2O3

Molecular Weight: 105.99

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, moist air.

Incompatibilities with Other Materials: Acids, strong oxidizing agents, metals, fluorine, hydrogen peroxide, phosphorus pentoxide, 2,4,6-trinitrotoluene, 2,-4-dinitrotoluene.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 497-19-8: VZ4050000

LD50/LC50:

CAS# 497-19-8:

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, eye: 50 mg Severe;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, mouse: LC50 = 1200 mg/m³/2H;

Inhalation, rat: LC50 = 2300 mg/m³/2H;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, rat: LD50 = 4090 mg/kg;

Carcinogenicity:

CAS# 497-19-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 320 mg/L; 96 Hr.; Static Conditions No data available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure 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# 497-19-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

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 # 497-19-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 497-19-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

WGK (Water Danger/Protection)

CAS# 497-19-8: 1

Canada - DSL/NDSL

CAS# 497-19-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 497-19-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Sodium Chlorate

ACC# 21100

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Chlorate

Catalog Numbers: S80176, S80176-1, S801761, S268 500, S268-500, S268500

Synonyms:

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7775-09-9	Sodium chlorate	ca.100	231-887-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Causes eye and skin irritation. May be harmful if swallowed. Causes digestive and respiratory tract irritation. May cause blood abnormalities. May cause kidney damage. May cause methemoglobinemia.

Target Organs: Blood, kidneys.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Causes skin irritation. May cause severe irritation and possible burns.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed. May cause burns to the gastrointestinal tract. May cause systemic effects by ingestion: blood hemolysis with or without anemia, methemoglobinemia-carboxyhemoglobinemia, and pulmonary changes. May cause damage to the red blood cells. May cause nausea, vomiting, and diarrhea, possibly with blood.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: Causes respiratory tract irritation. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

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. 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. 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: For methemoglobinemia, administer oxygen alone or with Methylene Blue depending on the methemoglobin concentration in the blood.

Antidote: Do not use oils, greases or protective cream on skin. Do NOT use oils or ointments in eye.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Use water with caution and in flooding amounts. May accelerate burning if involved in a fire.

Extinguishing Media: Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. Use water fog only.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: 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. Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Avoid ingestion and inhalation.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium chlorate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium chlorate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 5.0-7.0

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Decomposes

Freezing/Melting Point: 248 deg C

Material Safety Data Sheets, Carver Hall RM 208-A

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 2.4900

Molecular Formula: NaClO₃

Molecular Weight: 106.441

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, acids, alcohols, aluminum, amines, ammonia, phosphorus, steel, sulfuric acid, cyanides (e.g. potassium cyanide, sodium cyanide), sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), arsenic, carbon, arsenic trioxide, sodium phosphinate, charcoal, ammonium salts, metal powders, organic materials, thiocyanates, peat, saw dust, urotropine, thiuram, cyanoborane oligomer, alkenes + potassium osmate, aluminum + rubber, grease, leather, 1,3-bis (trichloromethylbenzene) + heat, ammonium sulfate, magnesium oxide, potassium cyanide.

Hazardous Decomposition Products: Chlorine, irritating and toxic fumes and gases, oxygen, sodium oxide, chlorine dioxide, which may be spontaneously explosive.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7775-09-9: FO0525000

LD50/LC50:

CAS# 7775-09-9:

Draize test, rabbit, eye: 10 mg Mild;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, rat: LC50 = >28 gm/m³/1H;

Oral, mouse: LD50 = 3600 mg/kg;

Oral, rabbit: LD50 = 7200 mg/kg;

Oral, rat: LD50 = 1200 mg/kg;

Skin, rabbit: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 7775-09-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: DNA Inhibition: Oral, rat = 84 mg/kg/12W (Continuous).

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 42000 mg/L; 24 Hr; UnspecifiedFish: Channel catfish: LC50 = 3157 mg/L; 24 Hr; UnspecifiedFish: Harlequin fish: LC50 = 8600 mg/L; 24 Hr; Static and flow-through bioassay No data available.

Environmental: Sodium chlorate is soluble in water to 75% and is most persistnet in areas of low rainfall where it may remain as long as 5 years.

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:	SODIUM CHLORATE	SODIUM CHLORATE
Hazard Class:	5.1	5.1
UN Number:	UN1495	UN1495
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7775-09-9 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.

Material Safety Data Sheets, Carver Hall RM 208-A

Section 12b

None of the chemicals are listed under TSCA Section 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 # 7775-09-9: delayed, 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 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# 7775-09-9 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 9 Explosive when mixed with combustible material.

Safety Phrases:

S 13 Keep away from food, drink and animal feeding stuffs.

S 17 Keep away from combustible material.

S 46 If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 7775-09-9: 2

Canada - DSL/NDSL

CAS# 7775-09-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sodium chloride

ACC# 21105

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium chloride

Catalog Numbers: AC194090000, AC194090010, AC194090050, AC1940900510, AC194090250, AC207790000, AC207790010, AC207790050, AC327300000, AC327300010, AC424290000, AC424290030, AC424290250, 42429-0010, 42429-5000, BP358-1, BP358-10, BP358-212, NC9269808, NC9380133, NC9460864, NC9634552, NC9780594, NC9821620, NC9826699, NC9919051, NC9974906, S271-1, S271-10, S271-10LC, S271-1LC, S271-3, S271-350LB, S271-50, S271-500, S271-50LC, S640-10, S640-10LC, S640-3, S640-350LB, S640-50, S640-500, S640SAM1, S640SAM2, S640SAM3, S641-212, S641-350LB, S641-500, S641P-350LB, S641P350LLC, S642-12, S642-212, S642-350LB, S642-500, S64212LC, S642350LBLC, S642SAM1, S642SAM2, S642SAM3, S671-10, S671-3, S671-500

Synonyms: Common salt; Halite; Rock salt; Saline; Salt; Sea salt; Table 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
7647-14-5	Sodium chloride	99+	231-598-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: None known.

Potential Health Effects

Material Safety Data Sheets, Carver Hall RM 208-A

Eye: May cause eye irritation. Exposure to solid may cause pain and redness.

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. Ingestion of large amounts may cause nausea and vomiting, rigidity or convulsions. Continued exposure can produce coma, dehydration, and internal organ

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: Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. May be combustible at high temperatures.

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: 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

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium chloride	none listed	none listed	none listed

OSHA Vacated PELs: Sodium chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 5.0 - 8.0 (5% aq.sol. 20°C)

Vapor Pressure: 1 mm Hg @ 865 deg C

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1461 deg C @ 760 mmHg

Freezing/Melting Point: 801 deg C

Decomposition Temperature: Not available.

Solubility: 360 g/L (20°C)

Specific Gravity/Density: 2.165

Molecular Formula: NaCl

Molecular Weight: 58.44

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: High temperatures, incompatible materials, dust generation, exposure to moist air or water.

Incompatibilities with Other Materials: Metals, strong oxidizing agents, strong acids, bromine trifluoride, nitro compounds, dichloromaleic anhydride + urea.

Hazardous Decomposition Products: Hydrogen chloride, sodium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7647-14-5: VZ4725000

LD50/LC50:

CAS# 7647-14-5:

- Draize test, rabbit, eye: 100 mg Mild;
- Draize test, rabbit, eye: 100 mg/24H Moderate;
- Draize test, rabbit, eye: 10 mg Moderate;
- Draize test, rabbit, skin: 50 mg/24H Mild;
- Draize test, rabbit, skin: 500 mg/24H Mild;
- Inhalation, rat: LC50 = >42 gm/m³/1H;
- Oral, mouse: LD50 = 4 gm/kg;
- Oral, rat: LD50 = 3000 mg/kg;
- Skin, rabbit: LD50 = >10 gm/kg;

Carcinogenicity:

CAS# 7647-14-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The only adverse effect noted from occupational exposures have been mild nasal irritation with exposure to high dust levels and hypertension.

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.

Material Safety Data Sheets, Carver Hall RM 208-A

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# 7647-14-5 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 # 7647-14-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Material Safety Data Sheets, Carver Hall RM 208-A

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# 7647-14-5 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# 7647-14-5: 0

Canada - DSL/NDSL

CAS# 7647-14-5 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

Sodium Citrate Dihydrate

ACC# 21135

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Citrate Dihydrate

Catalog Numbers: BP327-1, BP327-500, NC9561807, NC9561811, NC9561812, NC9561815, NC9561817, NC9561818, NC9996793, S279-10, S279-10LC, S279-275LB, S279-3, S279-50, S279-500, S279-500LC, S279-50KB, S466-3, S466-3LC, S467-3, S467SAM-1, S470-12, S470-12LC, S470-212, S470-212LC

Synonyms: 2-Hydroxy-1,2,3-Propanetricarboxylic Acid Trisodium Salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6132-04-3	Trisodium citrate dihydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use

Material Safety Data Sheets, Carver Hall RM 208-A

with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Trisodium citrate dihydrate	none listed	none listed	none listed
Trisodium citrate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Trisodium citrate dihydrate: No OSHA Vacated PELs are listed for this chemical. Trisodium citrate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 7.0-9.0 (5% solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 313.9 deg C

Decomposition Temperature: Not available.

Solubility: Soluble in water

Specific Gravity/Density: 1.665

Molecular Formula: Na₃C₆H₅O₇·2H₂O

Molecular Weight: 294.09

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6132-04-3 unlisted.

CAS# 68-04-2: GE8300000

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 6132-04-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 68-04-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous

Material Safety Data Sheets, Carver Hall RM 208-A

waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6132-04-3 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 68-04-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6132-04-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 68-04-2 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 6132-04-3: 0

CAS# 68-04-2: 0

Canada - DSL/NDSL

CAS# 68-04-2 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet
Sodium dichromate

ACC# 91827

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium dichromate

Catalog Numbers: S75212, S258-3

Synonyms: Sodium bichromate.

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10588-01-9	Sodium dichromate	100	234-190-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: orange to red crystals. **Danger!** Strong oxidizer. Contact with other material may cause a fire. May cause allergic skin reaction. May be fatal if inhaled. Harmful if swallowed or absorbed through the skin. Causes severe eye irritation and possible eye injury. May cause liver and kidney damage. May cause cancer by inhalation. Causes skin and respiratory tract irritation.

Target Organs: Kidneys, liver, respiratory system, eyes, skin.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: Causes skin irritation. Harmful if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Chrome ulcers, penetrating lesions of the skin, occur chiefly on the hand and forearm where there has been a break in the epidermis.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns. May cause liver and kidney damage.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: May be fatal if inhaled. Causes respiratory tract irritation. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated exposure may lead to asthma and perforation of the nasal septum. May cause cancer in humans.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Do not flush into a sewer. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Isolate area and deny entry. Provide ventilation. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Avoid contact with clothing and other combustible materials. Do not breathe dust. Use only with adequate ventilation or respiratory protection.

Storage: Do not store near combustible materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium dichromate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium dichromate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: orange to red

Odor: odorless

pH: 4 (10% solution)

Vapor Pressure: 0 mm Hg @ 20 deg C

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: 400 deg C (dec)

Freezing/Melting Point: 357 deg C

Decomposition Temperature: 400 deg C

Solubility: Freely Soluble.

Specific Gravity/Density: 2.52 @ 13°C

Material Safety Data Sheets, Carver Hall RM 208-A

Molecular Formula:Na₂Cr₂O₇

Molecular Weight:261.97

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Dust generation, excess heat.

Incompatibilities with Other Materials: Reducing agents, anhydrides, finely powdered metals, hydrazine, hydroxylamine, sulfuric acid, organic matter, hydrochloric acid, hydrazine derivatives, combustible materials.

Hazardous Decomposition Products: No data available.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10588-01-9; HX7700000; HX7720000

LD50/LC50:

CAS# 10588-01-9:

Oral, rat: LD50 = 50 mg/kg; <BR.

Carcinogenicity:

CAS# 10588-01-9: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals.

Teratogenicity: No data available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: A mutagenic effect has been demonstrated in animal studies on mammals.

Other Studies: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Concentration in organisms possible. Highly toxic for aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Section 13 - Disposal Considerations

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	OXIDIZING SOLID, TOXIC, N.O.S.				No information available.
Hazard Class:	5.1				
UN Number:	UN3087				
Packing Group:	III				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10588-01-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

CAS# 10588-01-9: Present

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 10588-01-9: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 10588-01-9: acute, chronic, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

Material Safety Data Sheets, Carver Hall RM 208-A

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 10588-01-9 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10588-01-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T+ O N

Risk Phrases:

R 21 Harmful in contact with skin.

R 25 Toxic if swallowed.

R 26 Very toxic by inhalation.

R 37/38 Irritating to respiratory system and skin.

R 41 Risk of serious damage to eyes.

R 43 May cause sensitization by skin contact.

R 46 May cause heritable genetic damage.

R 8 Contact with combustible material may cause fire.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

WGK (Water Danger/Protection)

CAS# 10588-01-9: 3

Canada - DSL/NDSL

CAS# 10588-01-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, C, D1A.

Canadian Ingredient Disclosure List

CAS# 10588-01-9 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

Material Safety Data Sheet

Sodium fluoride

ACC# 21230

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium fluoride

Catalog Numbers: AC191270000, AC191270010, AC191270250, AC191275000, AC201290000, AC201290250, AC201295000, AC424320000, AC424320050, AC424325000, S299-100, S299-3, S299-500

Synonyms: None.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-49-4	Sodium fluoride	>97	231-667-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white crystalline powder.

Danger! Causes irritation and possible burns by all routes of exposure. May be fatal if swallowed. Contact with acids liberates toxic gas. May cause lung damage. Moisture sensitive.

Target Organs: Kidneys, heart, gastrointestinal system, skeletal structures, teeth, nerves, bone.

Potential Health Effects

Eye: Causes eye irritation and possible burns. May cause chemical conjunctivitis and corneal damage.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May be fatal if swallowed. Ingestion of large amounts of fluoride may cause salivation, nausea, vomiting, abdominal pain, fever, labored breathing. Exposure to fluoride compounds can result in

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systemic toxic effects on the heart, liver, and kidneys. It may also deplete calcium levels in the body leading to hypocalcemia and death. May cause irritation of the digestive tract and possible burns. May cause respiratory paralysis and cardiac arrest.

Inhalation: May cause severe irritation of the respiratory tract with possible burns. Aspiration may lead to pulmonary edema. Prolonged exposure to dusts, vapors, or mists may result in the perforation of the nasal septum. May cause systemic effects.

Chronic: Chronic inhalation and ingestion may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Effects may be delayed. Chronic exposure may cause lung damage. Laboratory experiments have resulted in mutagenic effects. Chronic exposure to fluoride compounds may cause systemic toxicity. Skeletal effects may include bone brittleness, joint stiffness, teeth discoloration, tendon calcification, and osteosclerosis. Animal studies have reported the development of tumors.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Individuals who suffer from diabetes insipidus or some form of renal impairment may be at increased risk from the effects of fluoride. Due to delayed and persistent symptoms, observe patient closely for 48 hours. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Do NOT get water inside containers. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

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General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Do not flush into a sewer. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Do not allow contact with water. Discard contaminated shoes. Keep from contact with moist air and steam.

Storage: Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Store protected from moisture. Store away from alkalies.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium fluoride	2.5 mg/m ³ TWA (as F) (listed under Fluorides).	2.5 mg/m ³ TWA (as F) 250 mg/m ³ IDLH (as F)	2.5 mg/m ³ TWA (as dust) (listed under Fluorides). 2.5 mg/m ³ TWA (as F) (listed under Fluorides).

OSHA Vacated PELs: Sodium fluoride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

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Physical State: Crystalline powder
Appearance: white to off-white
Odor: odorless
pH: 7.4 (solution)
Vapor Pressure: 1 mm Hg @ 1077 deg C
Vapor Density: 1.45 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 1704 deg C
Freezing/Melting Point: 993 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: 2.78 (water=1)
Molecular Formula: NaF
Molecular Weight: 41.9882

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Moisture sensitive.
Conditions to Avoid: Incompatible materials, dust generation, moisture, excess heat.
Incompatibilities with Other Materials: Moisture, acids, alkalis, glass, oxidizing agents.
Hazardous Decomposition Products: Irritating and toxic fumes and gases, hydrogen fluoride gas, sodium oxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7681-49-4: WB0350000

LD50/LC50:

CAS# 7681-49-4:

- Draize test, rabbit, eye: 20 mg/24H Moderate;
- Oral, mouse: LD50 = 44 mg/kg;
- Oral, rabbit: LD50 = 200 mg/kg;
- Oral, rat: LD50 = 31 mg/kg;

Carcinogenicity:

CAS# 7681-49-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Oral, rat: TDLo = 617 mg/kg/2Y-C (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Endocrine - thyroid tumors and Musculoskeletal - tumors.; Oral, mouse: TDLo = 14 mg/kg/43W-C (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Skin and Appendages - tumors.

Teratogenicity: Oral, rat: TDLo = 240 mg/kg (female 11-14 day(s) after conception) Specific

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Developmental Abnormalities - musculoskeletal system.; Oral, rat: TDLo = 255 mg/kg (female 85 day(s) pre-mating) Specific Developmental Abnormalities - Central Nervous System.; Intraperitoneal, rat: TDLo = 9 mg/kg (female 10-18 day(s) after conception) Effects on Embryo or Fetus - extra-embryonic structures (e.g., placenta, umbilical cord) and Effects on Embryo or Fetus - fetal death.

Reproductive Effects: Oral, rat: TDLo = 150 mg/kg (male 30 day(s) pre-mating) Reproductive - Paternal Effects - spermatogenesis (incl. genetic material, sperm morphology, motility, and count) and Paternal Effects - testes, epididymis, sperm duct and Fertility - male fertility index (e.g. # males impregnating females per # males exposed to fertile nonpregnant females).; Oral, rat: TDLo = 221 mg/kg (female 1-20 day(s) after conception) Fertility - post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).

Mutagenicity: DNA Inhibition: Human, Fibroblast = 100 mg/L.; Cytogenetic Analysis: Human, Fibroblast = 20 mg/L.; Cytogenetic Analysis: Human, Lymphocyte = 20 mg/L.; Mutation in Mammalian Somatic Cells: Human, Lymphocyte = 440 mg/L.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Mosquito Fish: TLm = 419 ppm; 96 Hr; Fresh waterWater flea Daphnia: LC50 = 340 mg/L; 48 Hr; Unspecified No data available.

Environmental: Toxic to aquatic and plant life. Soil can bind fluorides tightly if the pH is greater than 6.5. Fluorides can be damaging to plants when present in acid soils.

Physical: No information available.

Other: Dangerous to aquatic life in high concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	SODIUM FLUORIDE, SOLID	SODIUM FLUORIDE
Hazard Class:	6.1	6.1
UN Number:	UN1690	UN1690
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-49-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7681-49-4: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7681-49-4: immediate, delayed.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7681-49-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7681-49-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Fluorides, inorganic), Minnesota, (listed as Fluorides), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 25 Toxic if swallowed.

R 32 Contact with acids liberates very toxic gas.

R 36/38 Irritating to eyes and skin.

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Safety Phrases:

S 22 Do not breathe dust.

S 36 Wear suitable protective clothing.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7681-49-4: 1

Canada - DSL/NDSL

CAS# 7681-49-4 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7681-49-4 is listed on the Canadian Ingredient Disclosure List.

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ALDRICH CHEMICAL CO -- SODIUM HYDROGEN CARBONATE, 99%, 34094-4 -- 6810-00N037241

=====
Product Identification
=====

Product ID:SODIUM HYDROGEN CARBONATE, 99%, 34094-4

MSDS Date:03/13/1992

FSC:6810

NIIN:00N037241

MSDS Number: BQVRP

=== 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:SODIUM BICARBONATE (1:1); (SODIUM HYDROGEN CARBONATE)
(BAKING SODA)

CAS:144-55-8

RTECS #:VZ0950000

Fraction by Wt: 99%

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50:(ORAL,RAT)4220 MG/KG

Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:ACUTE: MAY BE HARMFUL BY INHALATION,
INGESTION, OR SKIN ABSORPTION. MAY CAUSE IRRITATION. EXPOSURE TO
LARGE AMOUNTS CAN CAUSE GASTROINTESTINAL DISTURBANCES, ALKALOSIS,
AN ABNORMAL CONDITION OF INCREASED ALKALINITY OF THE BLOOD AND
TISSUES.HEAVY OR PROLONGED SKIN EXPOSURE MAY RESULT IN THE
ABSORPTION (EFFECTS OF OVEREXPOSURE)

Explanation of Carcinogenicity:NOT RELEVANT

Effects of Overexposure:HEALTH HAZARD: OF HARMFUL AMOUNTS OF MATERIAL.

Medical Conditions 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: FLUSH WITH WATER. INHALATION: REMOVE TO FRESH
AIR. INGESTION: WASH OUT MOUTH WITH WATER PROVIDED PERSON IS
CONSCIOUS. CALL A PHYSICIAN.

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=====
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:NONE SPECIFIED BY MANUFACTURER.

=====
Accidental Release Measures
=====

Spill Release Procedures:WEAR NIOSH/MSHA APPROVED RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS & HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPIL L SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
Handling and Storage
=====

Handling and Storage Precautions:AVOID BREATHING DUST. AVOID CONTACT W/EYES/SKIN/CLTHG. KEEP TIGHTLY CLOSED. PROTECT FROM MOISTURE. STORE IN A COOL DRY PLACE.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:WEAR NIOSH/MSHA APPROVED DUST MASK.
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
WASTE DISP METH: WHICH CAN BE CONTROLLED BY RATE OF ADDN. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

=====
Physical/Chemical Properties
=====

HCC:N1
Spec Gravity:2.160
Appearance and Odor:WHITE POWDER

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS, MOISTURE SENSITIVE, STRONG ACIDS.
Stability Condition to Avoid:MOISTURE SENSITIVE.
Hazardous Decomposition Products:CARBON MONOXIDE, CARBON DIOXIDE.

=====
Disposal Considerations
=====

Waste Disposal Methods:FOR SM QTY: CAUTIOUSLY ADD TO A LG STIRRED EXCESS OF WATER. ADJUST PH TO NEUT, SEPARATE ANY INSOL SOLIDS/LIQ & PKG THEM FOR HAZ-WASTE DISP. FLUSH AQUEOUS SOLN DOWN DRAIN W/PLENTY OF WATER. HYDROLYSIS & NEUT RXN MAY GENERATE HEAT & FUMES (SUPP DATA)

Disclaimer (provided with this information by the compiling agencies):

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Material Safety Data Sheet

Sodium Hydrosulfite

ACC# 21290

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Hydrosulfite

Catalog Numbers: S80182, 23402355, S310-100, S310-500, S80182-1, S801821

Synonyms: Sodium Hydrosulphite; Sodium Sulfoxylate; Sodium Dithionite

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7775-14-6	SODIUM DITHIONITE	100%	231-890-0

Hazard Symbols: XN

Risk Phrases: 22 31 7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. **Warning!** Flammable solid. May cause respiratory and digestive tract irritation. May cause eye and skin irritation. Sensitizer. Air sensitive. Moisture sensitive. May cause central nervous system effects.

Target Organs: Central nervous system.

Potential Health Effects

Eye: May cause lacrimation (tearing), blurred vision, and photophobia. May cause chemical conjunctivitis and corneal damage.

Skin: May cause skin irritation and possible burns.

Ingestion: May cause nausea, vomiting, abdominal pain, and increased salivation.

Inhalation: May cause allergic respiratory tract irritation. Inhalation of dust may cause respiratory tract

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irritation. Olfactory fatigue may occur. Can produce delayed pulmonary edema.

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.

Skin: Get medical aid if irritation develops or persists. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid 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: Treat symptomatically

Section 5 - Fire Fighting Measures

General Information: Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. 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. Dust can be an explosion hazard when exposed to heat or flame. Flammable solid. May burn rapidly with flare burning effect. May re-ignite after fire is extinguished. May react violently or explosively on contact with water. May decompose explosively when heated or involved in a fire.

Extinguishing Media: Do NOT get water inside containers. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. DO NOT USE WATER, CO₂, OR FOAM DIRECTLY ON FIRE ITSELF. May require flooding with water in order to eliminate hazardous reactions since the materials generate their own oxygen. For large fires, use dry sand, dry chemical, soda ash or lime or withdraw from area and let fire burn. For small fires, use dry chemical, soda ash, lime or dry sand.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

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: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid

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generating dusty conditions. Remove all sources of ignition. Place under an inert atmosphere. Do not get water inside containers.

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. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Handle under an inert atmosphere. Store protected from air. Do not allow contact with water. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Keep from contact with moist air and steam.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Do not expose to air. Store protected from moisture. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
SODIUM DITHIONITE	none listed	none listed	none listed

OSHA Vacated PELs: SODIUM DITHIONITE: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: sulfurous odor - weak odor

pH: Acidic in solution

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Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: decomposes
Decomposition Temperature: 135 deg C
Solubility: 25 g/100ml (20 C)
Specific Gravity/Density: 2.2
Molecular Formula: Na₂ O₄ S₂
Molecular Weight: 174.10

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Ignition sources, dust generation, moisture, exposure to air, contact with water, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, moisture, air.
Hazardous Decomposition Products: Carbon monoxide, oxides of sulfur, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7775-14-6 unlisted.
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 7775-14-6: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: No information available.
Other Studies: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

No information available.

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Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous 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:	DOT regulated - small quantity provisions apply (see 49CFR173.4)				SODIUM DITHIONITE
Hazard Class:					4.2
UN Number:					UN1384
Packing Group:					II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7775-14-6 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.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

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None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7775-14-6: acute, flammable, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7775-14-6 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

Risk Phrases:

R 22 Harmful if swallowed.

R 31 Contact with acids liberates toxic gas.

R 7 May cause fire.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 28 After contact with skin, wash immediately with...

S 7/8 Keep container tightly closed and dry.

S 43E In case of fire, use dry sand (never use water).

WGK (Water Danger/Protection)

CAS# 7775-14-6: 1

Canada - DSL/NDSL

CAS# 7775-14-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, D2B.

Canadian Ingredient Disclosure List

Exposure Limits

Material Safety Data Sheet
Sodium Hydroxide 10%

ACC# 89958

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Hydroxide 10%

Catalog Numbers: 35037

Synonyms:

Company Identification:

Fisher Diagnostics
Fisher Scientific Company, LLC
8365 Valley Pike
Middletown, VA 22645-0307

For information, call: 800-524-0294

Emergency Number: 800-524-0294

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	90	231-791-2
1310-73-2	Sodium hydroxide	10.0	215-185-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: Not available. **Danger!** Causes eye burns. Causes digestive tract burns. Corrosive. Causes skin burns. Causes respiratory tract burns.

Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes severe eye burns.

Skin: Causes skin burns. May cause deep, penetrating ulcers of the skin.

Ingestion: Causes gastrointestinal tract burns. Causes severe pain, nausea, vomiting, diarrhea, and shock.

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.

Chronic: Prolonged or repeated skin contact may cause 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 immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Do NOT get water inside containers. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: 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. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. 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, well-ventilated area away from incompatible substances. Keep away from

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strong acids. Keep away from metals. Keep away from flammable liquids. Keep away from organic halogens.

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
Water	none listed	none listed	none listed
Sodium hydroxide	2 mg/m ³ Ceiling	10 mg/m ³ IDLH	2 mg/m ³ TWA

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Sodium hydroxide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical 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. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: Not available.

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

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Chemical Stability: Stable.

Conditions to Avoid: Extreme temperatures.

Incompatibilities with Other Materials: Acids, metals, flammable liquids, halogenated organics (e.g. dibromoethane, hexachlorobenzene, methyl chloride, trichloroethylene), aluminum, tin, zinc, nitromethane, nitro compounds.

Hazardous Decomposition Products: Toxic fumes of sodium oxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 1310-73-2: WB4900000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg; <BR.

CAS# 1310-73-2:

Draize test, rabbit, eye: 400 ug Mild;

Draize test, rabbit, eye: 1% Severe;

Draize test, rabbit, eye: 50 ug/24H Severe;

Draize test, rabbit, eye: 1 mg/24H Severe;

Draize test, rabbit, skin: 500 mg/24H Severe; <BR.

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 1310-73-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: No information reported.

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

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waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	No information available.	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 1310-73-2 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.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 1310-73-2: 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 # 1310-73-2: acute, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 1310-73-2 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product

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are listed as Priority Pollutants under the CWA. None of the chemicals in this product 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# 1310-73-2 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:

C

Risk Phrases:

R 35 Causes severe burns.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

S 24/25 Avoid contact with skin and eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 28A After contact with skin, wash immediately with plenty of water.

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 1310-73-2: 1

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 1310-73-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E.

Canadian Ingredient Disclosure List

CAS# 1310-73-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium Iodide

ACC# 91778

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Iodide

Catalog Numbers: S75213, S75214, S75215, S93372

Synonyms: Sodium Monoiodide; Sodium Iodine; Anayodin.

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

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For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7681-82-5	Sodium Iodide	ca. 100	231-679-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause respiratory and digestive tract irritation. May cause eye and skin irritation. Prolonged exposure may cause pulmonary edema. This substance has caused adverse reproductive and fetal effects in animals. Air sensitive. Light sensitive. Moisture sensitive.

Target Organs: None.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause respiratory tract irritation.

Chronic: Prolonged or repeated exposure may cause adverse reproductive effects. Chronic exposure can lead to iodism characterized by salivation, nasal discharge, sneezing, conjunctivitis, fever, laryngitis, bronchitis, stomatitis, and skin rashes. Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial

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respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: N/A

Upper: N/A

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Place under an inert atmosphere. Do not get water inside containers.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Store protected from light. Handle under an inert atmosphere. Store protected from air. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Store in a cool place in the original container and protect from sunlight. Do not store in direct sunlight. Store in a tightly closed container. Do not expose to air. Store protected from moisture. Store protected from light. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash

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facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium Iodide	none listed	none listed	none listed

OSHA Vacated PELs: Sodium Iodide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: Not available.

pH: Not available.

Vapor Pressure: 1.3 mbar @ 767 deg

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1300 deg C @ 760.00mm Hg

Freezing/Melting Point: 661 deg C

Decomposition Temperature: Not available.

Solubility: 1790 G/L (20°C)

Specific Gravity/Density: 3.6670g/cm³

Molecular Formula: INa

Molecular Weight: 149.89

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light, moisture, exposure to air, contact with water, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, hydrogen iodide, sodium oxide, iodine.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7681-82-5: WB6475000

LD50/LC50:

CAS# 7681-82-5:

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Moderate;

Oral, mouse: LD50 = 1000 mg/kg;

Oral, rat: LD50 = 4340 mg/kg;

Carcinogenicity:

CAS# 7681-82-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: See RTECS for actual entry.

Reproductive Effects: See RTECS for actual entry.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: This chemical is expected to cause little oxygen depletion in aquatic systems. Fathead minnow, LC50: 3200ng/L (96H), Water flea, LC50: 3.3mg/L (96H), Golden orfe, LC50: 10,000mg/L. This chemical is not likely to bioconcentrate.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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	US DOT	Canada TDG
Shipping Name:	Please contact Fisher Scientific for shipping information	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7681-82-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 7681-82-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7681-82-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

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European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7681-82-5: 1

Canada - DSL/NDSL

CAS# 7681-82-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7681-82-5 is listed on the Canadian Ingredient Disclosure List.

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FISHER SCIENTIFIC CO. CHEMICAL MFG DIV -- S242-12,SODIUM METABISULFITE -- 6810-00-300-0384

===== Product Identification =====

Product ID:S242-12,SODIUM METABISULFITE
MSDS Date:04/02/1998
FSC:6810
NIIN:00-300-0384
Status Code:A
MSDS Number: CKKZG
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410-2802
Country:US
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100
Preparer's Name:NOT PROVIDED
Chemtrec Ind/Phone:(800)424-9300
CAGE:1B464

===== Contractor Identification =====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

===== Composition/Information on Ingredients =====

Ingred Name:SODIUM METABISULFITE
CAS:7681-57-4
RTECS #:UX8225000
> Wt:97.
Other REC Limits:NOT PROVIDED
OSHA PEL:NONE
Code:F
ACGIH TLV:5 MG/M3

===== Hazards Identification =====

LD50 LC50 Mixture:LD50 (ORAL, RAT) 1130-1900 MG/KG
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:POTENTIAL HEALTH EFFECTS: EYE: MAY CAUSE EYE IRRITATION. SKIN: MAY CAUSE SKIN IRRITATION. MAY CAUSE SKIN SENSITIZATION, AN ALLERGIC REACTION, WHICH BECOMES EVIDENT UPON RE-EXPOSURE TO THIS MATERIAL. INGESTION: MAY CAUSE GASTROINTESTINAL IRRITATION WITH NAUSEA, VOMITING AND DIARRHEA. MAY BE HARMFUL IF SWALLOWED. EXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION, GASTROINTESTINAL AND CARDIAC ABNORMALITIES AND VIOLENT COLIC. INHALATION: MAY CAUSE ALLERGIC RESPIRATORY REACTION. MAY CAUSE SYMPTOMS SIMILAR TO INGESTION. CHRONIC: PROLONGED SKIN CONTACT MAY CAUSE DERMATITIS. EXPOSURE MAY CAUSE ALLERGIC REACTIONS IN SENSITIVE INDIVIDUALS.

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Explanation of Carcinogenicity:NOT CLASSIFIABLE AS A HUMAN CARCINOGEN.
Effects of Overexposure:EYE: MAY CAUSE EYE IRRITATION. SKIN: MAY CAUSE SKIN IRRITATION. MAY CAUSE SKIN SENSITIZATION, AN ALLERGIC REACTION, WHICH BECOMES EVIDENT UPON RE-EXPOSURE TO THIS MATERIAL. INGESTION: MAY CAUSE GASTRO INTESTINAL IRRITATION WITH NAUSEA, VOMITING AND DIARRHEA. MAY BE HARMFUL IF SWALLOWED. EXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION, GASTROINTESTINAL AND CARDIAC ABNORMALITIES AND VIOLENT COLI C. INHALATION: MAY CAUSE ALLERGIC RESPIRATORY REACTION. MAY CAUSE SYMPTOMS SIMILAR TO INGESTION.

Medical Cond Aggravated by Exposure:SULFITE COMPOUNDS MAY CAUSE A SEVERE ALLERGIC REACTION IS SENSITIVE INDIVIDUALS AND SOME ASTHMATICS.

===== First Aid Measures =====

First Aid:EYES: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER AND LOWER LIDS. GET MEDICAL AID IMMEDIATELY. SKIN: GET MEDICAL AID. IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND 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 TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL AID.

===== Fire Fighting Measures =====

Flash Point:NOT AVAILABLE
Lower Limits:NOT AVAILABL
Upper Limits:NOT AVAILABL
Extinguishing Media:IN CASE OF FIRE, USE WATER FOG, DRY CHEMICAL, CARBON DIOXIDE OR REGULAR FOAM.
Fire Fighting Procedures:AS IN ANY FIRE, WEAR A SELF CONTAINED BREATHING APPARATUS IN PRESSURE-DEMAND, MSHA/NIOSH (APPROVED OR EQUIVALENT), AND FULL PROTECTIVE GEAR. COMBUSTION GENERATES TOXIC FUMES.
Unusual Fire/Explosion Hazard:NOT PROVIDED

===== Accidental Release Measures =====

Spill Release Procedures:USE PROPER PERSONAL PROTECTIVE EQUIPMENT. SWEEP UP, THEN PLACE INTO A SUITABLE CONTAINER FOR DISPOSAL. AVOID GENERATING DUSTY CONDITIONS. DO NOT GET WATER INSIDE CONTAINERS.
Neutralizing Agent:NOT PROVIDED

===== Handling and Storage =====

Handling and Storage Precautions:STORE IN A TIGHTLY CLOSED CONTAINER. STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE SUBSTANCES. KEEP AWAY FROM STRONG ACIDS.
Other Precautions:WASH THOROUGHLY AFTER HANDLING. MINIMIZE DUST GENERATION AND ACCUMULATION. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. KEEP CONTAINER TIGHTLY CLOSED. AVOID INGESTION AND INHALATION.

===== Exposure Controls/Personal Protection =====

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Respiratory Protection:FOLLOW THE OSHA RESPIRATOR REGULATIONS FOUND IN 29 CFR 1910.134. ALWAYS USE A NIOSH-APPROVED RESPIRATOR WHEN NECESSARY.

Ventilation:NOT PROVIDED

Protective Gloves:WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT SKIN EXPOSURE.

Eye Protection:WEAR APPROPRIATE EYEGLASSES OR CHEMICAL SAFETY GOGGLES PER OSHA 29 CFR 1910.133

Other Protective Equipment:WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT SKIN EXPOSURE.

Work Hygienic Practices:NOT PROVIDED

Supplemental Safety and Health

NOTE TO PHYSICIAN: TREAT SYMPTOMTICALLY AND SUPPORTIVELY.

===== Physical/Chemical Properties =====

HCC:C3

NRC/State Lic Num:NOT RELEVANT

Boiling Pt:B.P. Text:DECOMPOSES

Melt/Freeze Pt:M.P/F.P Text:DECOMPOSES

Decomp Temp:>150.C, 302.F

Vapor Pres:NEGLIGIBLE

Vapor Density:NEGLIGIBLE

Spec Gravity:1.48

pH:4.3 (1\$ SOL.)

Viscosity:NOT AVAILABLE

Evaporation Rate & Reference:NEGLIGIBLE

Solubility in Water:SOLUBLE

Appearance and Odor:WHITE TO YELLOW SOLID - WEAK ODOR

Corrosion Rate:NOT PROVIDED

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

STRONG OXIDIZER. SUBSTANCE MAY PRODUCE SULFUR DIOXIDE GAS WHEN IN CONTACT WITH ACIDS AND/OR WATER (ICE).

Stability Condition to Avoid:MOISTURE, EXPOSURE TO AIR, OXIDIZERS

Hazardous Decomposition Products:OXIDES OF SULFUR, TOXIC FUMES OF SODIUM OXIDE.

===== Toxicological Information =====

Toxicological Information:DERMAL, GUINEA PIG: LD50 > 1 G/KG; ORAL, RAT: LD50 = 1130-1900 MG/KG

===== Ecological Information =====

Ecological:ECOTOXICITY: NO INFORMATION AVAILABLE. ENVIRONMENTAL FATE: NO INFORMATION REPORTED. PHYSICAL/CHEMICAL: NO INFORMATION AVAILABLE. OTHER: NOT AVAILABLE.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL, STATE, AND LOCAL REGULATIONS. NOT LISTED AS A MATERIAL BANNED FROM LAND DISPOSAL ACCORDING TO RCRA.

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===== MSDS Transport Information =====

Transport Information:US DOT: NO INFORMATION AVAILABLE. IMO: NO INFORMATION AVAILABLE. IATA: NO INFORMATION AVAILABLE.

===== Regulatory Information =====

SARA Title III Information:SECTION 302 (RQ): NONE OF THE CHEMCALS IN THIS MATERIAL HAVE AN RQ. SECTION 302 (TPQ): NONE OF THE CHEMCALS IN THIS PRODUCT HAVE A TPQ. SARA CODES: CAS# 7681-57-4: ACUTE. SECTION 313: NO CHEMICALS AR E REPORTABLE UNDER SECTION 313.

Federal Regulatory Information:CLEAN AIR ACT: THIS MATERIAL DOES NOT CONTAIN ANY HAZARDOUS AIR POLLUTANTS. THIS MATERIAL DOES NOT CONTAIN ANY CLASS 1 OR CLASS 2 OZONE DEPLETORS. CLEAN WATER ACT: NONE OF THE CHEMICALS IN THIS PRODUC T ARE LISTED AS HAZARDOUS SUBSTANCES UNDER CWA. NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS PRIORITY POLLUTANTS UNDER THE CWA. NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS TOXIC POLLUTA NTS UNDER THE CWA. OSHA: NONE OF THE CHEMICALS IN THIS PRODUCT ARE CONSIDERED HIGHLY HAZARDOUS BY OS HA. TSCA: CAS# 7681-57-4 IS LISTED ON THE TSCA INVENTORY.

State Regulatory Information:SODIUM METABISULFITE CAN BE FOUND ON THE FOLLOWING STATE RIGHT TO KNOW LISTS: CALIFORNIA, NEW JERSEY, FLORIDA, PENNSYLVANIA, MINNESOTA, MASSACHUSETTS. CALIFORNIA NO SIGNIFICANT RISK LEVEL: NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED.

===== Other Information =====

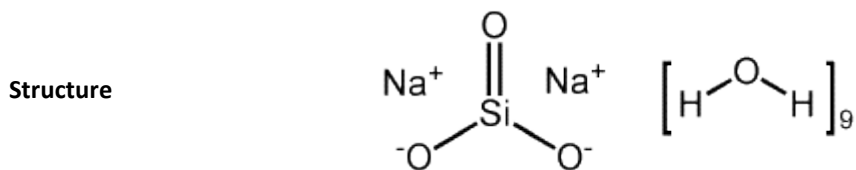
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Sodium metasilicate nonahydrate

- Disodium oxosilanediolate nonahydrate

Formula $\text{Na}_2\text{SiO}_3 \cdot 9\text{H}_2\text{O}$



Description Colorless or white solid.

Registry Numbers and Inventories.

CAS 13517-24-3

NIH PubChem CID 61639

EC (EINECS/ELINCS) 603-903-3

UN (DOT) 1759

Beilstein/Gmelin 190963 (G)

New Zealand Listed

Japan ENCS (MITI) Listed

Philippiens PICCS Listed

Properties.

Formula $\text{H}_{18}\text{Na}_2\text{O}_{12}\text{Si}$

Formula mass 284.20

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Melting point, °C	40
Density	2.62 g/cm ³ (21 C)
Solubility in water	Readily soluble

Hazards and Protection.

Storage	Keep away from heat, sparks, and flame. Store in a cool, dry place. Keep container closed when not in use. Corrosives area.
Handling	Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Use with adequate ventilation. Discard contaminated shoes.
Protection	Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators	A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.
Small spills/leaks	Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, using the appropriate protective equipment. Avoid generating dusty conditions. Provide ventilation.
Stability	Stable under normal temperatures and pressures.
Incompatibilities	Strong acids, strong oxidizing agents.
Decomposition	Irritating and toxic fumes and gases, silicon oxide.

Fire.

Fire fighting	Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the
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surrounding fire. Substance is noncombustible. Extinguishing media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Fire potential

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Hazards

Contact with metals may evolve flammable hydrogen gas.

Combustion products

Fire may produce irritating, corrosive and/or toxic gases.

[NFPA](#)

Health 3

Flammability 0

Reactivity 0

Health.

Exposure effects

Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Effects may be delayed. Chronic inhalation may cause lung damage, bronchitis, and silicosis. May decrease blood clotting. Prolonged exposure to respirable crystalline quartz may cause delayed lung injury/fibrosis (silicosis).

Ingestion

May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause perforation of the digestive tract. May cause systemic effects.

Inhalation

Causes chemical burns to the respiratory tract. Aspiration may lead to pulmonary edema. May cause systemic effects. Contains crystalline silica which may lead to respiratory abnormalities and silicosis.

Skin

Causes skin burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Eyes

Causes eye burns. May cause chemical conjunctivitis and corneal damage.

First aid

Ingestion

Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never

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give anything by mouth to an unconscious person. Get medical aid.

Inhalation

Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Skin

Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Eyes

Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation is required (at least 30 minutes).

Transportation.

UN number 1759

Response guide [154](#)

Hazard class 8



Packing Group I; II; III

Material Safety Data Sheet

Sodium nitrite

ACC# 21410

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium nitrite

Catalog Numbers: AC196620000, AC196620025, AC217600000, AC217600010, AC424350000, AC424350020, AC424350050, 42435-5000, NC9151301, NC9790812, S338-3, S347-10, S347-250, S347-3, S347-500

Synonyms: Nitrous acid, sodium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7632-00-0	Sodium nitrite	>97	231-555-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to light yellow crystals.

Danger! May be fatal if inhaled. Strong oxidizer. Contact with other material may cause a fire. Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May cause methemoglobinemia. This substance has caused adverse reproductive and fetal effects in animals. Air sensitive. Hygroscopic (absorbs moisture from the air).

Target Organs: Blood, cardiovascular system, smooth muscle.

Potential Health Effects

Eye: Causes eye irritation. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Causes skin irritation. May be absorbed through the skin.

Ingestion: Harmful if swallowed. May cause methemoglobinemia, cyanosis (bluish discoloration of skin)

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due to deficient oxygenation of the blood), convulsions, and death. Causes digestive tract irritation. Ingestion may cause weakness, muscular incoordination, fine tremors, loss of reflexes, convulsions and possible death from circulatory collapse. Ingestion may cause a decrease in blood pressure, rapid pulse and visual disturbances.

Inhalation: May be fatal if inhaled. May cause methemoglobinemia, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), convulsions, tachycardia, dyspnea (labored breathing), and death. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Animal studies have reported the development of tumors. Sodium nitrate may react with secondary or tertiary amines to form nitrosamines (certain nitrosamines are cancer suspect agents).

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. SPEED IS ESSENTIAL, OBTAIN MEDICAL AID IMMEDIATELY.

Notes to Physician: Absorption of this product into the body may cause cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood). Moderate degrees of cyanosis need to be treated only by supportive measures: bed rest and oxygen inhalation. If cyanosis is severe, intravenous injection of Methylene Blue, 1mg/kg of body weight may be of value.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. Use water with caution and in flooding amounts. May explode from heat or contamination. May accelerate burning if involved in a fire.

Extinguishing Media: Use water only! Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For large fires, flood fire area with water from a distance. Do NOT use dry chemicals, CO₂, Halon or foams.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 1; Special Hazard: OX

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Handle under an inert atmosphere. Store protected from air. Use only in a chemical fume hood.

Storage: Do not store near combustible materials. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air. Store protected from moisture. Store under an inert atmosphere. Avoid storage on wood floors.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium nitrite	none listed	none listed	none listed

OSHA Vacated PELs: Sodium nitrite: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Material Safety Data Sheets, Carver Hall RM 208-A

Physical State: Crystals

Appearance: white to light yellow

Odor: odorless

pH: ~ 9

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 320 deg C

Freezing/Melting Point: 271 deg C

Decomposition Temperature: 320 deg C

Solubility: Soluble.

Specific Gravity/Density: 2.168

Molecular Formula: NaNO₂

Molecular Weight: 69

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Unstable if heated, may explode at temperatures greater than 533°C.

Conditions to Avoid: Ignition sources, dust generation, exposure to air, exposure to moist air or water, temperatures above 320°C.

Incompatibilities with Other Materials: Reducing agents, acids, amines, chlorates, permanganates, cyanides (e.g. potassium cyanide, sodium cyanide), metals as powders (e.g. hafnium, raney nickel), hypophosphites, sulfites, tannic acid, organic matter, antipyrine, ammonium salts, acetanilide, iodides, mercury salts, moisture, air, activated carbon, vegetable astringents.

Hazardous Decomposition Products: Oxides of nitrogen, irritating and toxic fumes and gases.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7632-00-0: RA1225000; RA1425000

LD50/LC50:

CAS# 7632-00-0:

Draize test, rabbit, eye: 500 mg/24H Mild;

Inhalation, rat: LC50 = 5.5 mg/m³/4H;

Oral, mouse: LD50 = 175 mg/kg;

Oral, rabbit: LD50 = 186 mg/kg;

Oral, rat: LD50 = 180 mg/kg;

Carcinogenicity:

CAS# 7632-00-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

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Epidemiology: Oral, rat: TDLo = 2190 gm/kg/2Y-C (Tumorigenic - Carcinogenic by RTECS criteria - Gastrointestinal - tumors).; Oral, rat: TD = 91 gm/kg/2Y-C (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Skin and Appendages - tumors and Reproductive - Tumorigenic effects - testicular tumors).; Oral, rat: TD = 40 gm/kg/56W-C - (Tumorigenic - neoplastic by RTECS criteria - Liver - tumors).

Teratogenicity: Oral, rat: TDLo = 660 mg/kg (female 1-22 day(s) after conception) Effects on Embryo or Fetus - fetal death and Effects on Newborn - growth statistics (e.g. %, reduced weight gain).; Oral, rat: TDLo = 10280 mg/kg (female 1-22 day(s) after conception and lactating female 20 day(s) post-birth) Effects on Newborn - weaning or lactation index (e.g., # alive at weaning per # alive at day 4).; Oral, mouse: TDLo = 280 mg/kg (female 1-14 day(s) after conception) Specific Developmental Abnormalities - blood and lymphatic systems (including spleen and marrow).

Reproductive Effects: Oral, mouse: TDLo = 1200 mg/kg (female 6-15 day(s) after conception) Fertility - pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea).; Oral, mouse: TDLo = 1680 mg/kg (male 14 day(s) pre-mating) Fertility - male fertility index (e.g. # males impregnating females per # males exposed to fertile nonpregnant females).; Oral, mouse: TDLo = 840 mg/kg (male 14 day(s) pre-mating) Paternal Effects - spermatogenesis (incl. genetic material, sperm morphology, motility, and count).

Mutagenicity: Unscheduled DNA Synthesis: Human, HeLa cell = 6 mmol/L.; DNA Inhibition: Human, Fibroblast = 2000 ppm.; DNA Inhibition: Human Cells - not otherwise specified = 725 umol/L.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Rainbow trout: LC50 = 0.19-0.39 mg/L; 96 Hr; Flow-through bioassay Fish: Mosquito Fish: TLm = 8.1 ppm; 24 Hr; Highly turbid water Fish: Creek chub: Critical range = 400-2000 ppm; 24 Hr; Detroit River No data available.

Environmental: In water sodium nitrite dissociates completely and under aerobic conditions the nitrite ions are oxidized to nitrates.

Physical: No information available.

Other: Harmful to aquatic life in very low concentrations.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

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	US DOT	Canada TDG
Shipping Name:	SODIUM NITRITE	SODIUM NITRITE
Hazard Class:	5.1	5.1(6.1)
UN Number:	UN1500	UN1500
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7632-00-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7632-00-0: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7632-00-0: immediate, delayed, fire.

Section 313

This material contains Sodium nitrite (CAS# 7632-00-0, >97%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7632-00-0 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7632-00-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

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European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T O N

Risk Phrases:

R 25 Toxic if swallowed.

R 8 Contact with combustible material may cause fire.

R 50 Very toxic to aquatic organisms.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 7632-00-0: 2

Canada - DSL/NDSL

CAS# 7632-00-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of C, D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7632-00-0 is listed on the Canadian Ingredient Disclosure List.

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FISHER SCIENTIFIC, CHEMICAL DIV. -- SODIUM NITROPRUSSIDE,S 350 100,S 350100 -- 6505-01-009-5019

=====
Product Identification
=====

Product ID:SODIUM NITROPRUSSIDE,S 350 100,S 350100
MSDS Date:12/12/1997
FSC:6505
NIIN:01-009-5019
MSDS Number: BPXFM
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIR LAWN
State:NJ
ZIP:07410
Country:US
Info Phone Num:201-796-7100 OR 201-796-7523
Emergency Phone Num:201-796-7100/800-424-9300 (CHEMTREC)
CAGE:1B464

=====
Contractor Identification
=====

Company Name:FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410-2802
Country:US
Phone:201-796-7100
CAGE:1B464

=====
Composition/Information on Ingredients
=====

Ingred Name:SODIUM NITROPRUSSIDE/NITROFERRICYANIDE
CAS:14402-89-2
RTECS #:LJ8750000
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:5 MG/M3 (CYANIDES)
ACGIH TLV:S, 5 MG/M3 CYANIDES

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL, RAT) IS 99 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:TARGET ORGANS:HEART. ACUTE- MAY BE HARMFUL IF SWALLOWED. MAY CAUSE CARDIAC DISTURBANCES. EYE CONTACT MAY CAUSE IRRITATION. MAY IRRITATE SKIN ON CONTACT. INHALATION MAY CAUSE RESPIRATORY TRACT IRRITATI ON. MAY CAUSE CARDIAC ABNORMALITIES. THE TOXICOLOGICAL PROPERTIES HAVE NOT BEEN FULLY INVESTIGATED. CHRONIC- UNKNOWN.
Explanation of Carcinogenicity:NONE
Effects of Overexposure:IRRITATION, DISCOMFORT, TEARING, BLURRING OF VISION, NAUSEA, HEADACHE, DIZZINESS, VOMITING, WEAKNESS
Medical Cond Aggravated by Exposure:PERSONS WITH PRE-EXISTING SKIN DISORDERS, EYE PROBLEMS OR IMPAIRED HEART OR RESPIRATORY FUNCTION MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS PRODUCT.

=====
First Aid Measures
=====

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First Aid:GET MEDICAL HELP IF SYMPTOMS PERSIST. INHALED:MOVE TO FRESH AIR. PROVIDE CPR/OXYGEN IF NEEDED. EYES:IMMEDIATELY FLUSH WITH WATER FOR 15 MINUTES. HOLD EYELIDS OPEN. CALL PHYSICIAN.
SKIN:IMMEDIATELY FLUSH WITH PLENTY OF WATER. ORAL:IF CONSCIOUS & ALERT, DRINK 2-4 CUPFULS OF MILK OR WATER. GET MEDICAL ATTENTION IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

==== Fire Fighting Measures =====

Flash Point:NONE
Lower Limits:NOT RELEVANT
Upper Limits:NOT RELEVANT
Extinguishing Media:SMALL FIRE:WATER SPRAY, CARBON DIOXIDE, ALCOHOL-RESISTANT FOAM/DRY CHEMICAL. COOL FIRE EXPOSED CONTAINERS WITH WATER.
Fire Fighting Procedures:AS WITH ANY FIRE, WEAR PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS TO AVOID INHALATION OF HAZARDOUS DECOMPOSITION PRODUCTS OR SMOKE
Unusual Fire/Explosion Hazard:TOXIC GASES

==== Accidental Release Measures =====

Spill Release Procedures:WEAR PROTECTIVE CLOTHING AND RESPIRATORY EQUIPMENT SUITABLE FOR TOXIC DUSTS. SWEEP, SCOOP OR PICK UP SPILLED MATERIAL. AVOID DUST DISPERSAL. PACKAGE FOR DISPOSAL. WET SWEEPING OR VACUUMING IS RECOMMENDED. WASH SPILL AREA TO REMOVE RESIDUAL CONTAMINATE
Neutralizing Agent:NOT RELEVANT

==== Handling and Storage =====

Handling and Storage Precautions:STORE IN COOL, DRY, VENTILATED PLACE AWAY FROM STRONG OXIDIZING AGENTS. KEEP CONTAINER TIGHTLY CLOSED. PROTECT AGAINST PHYSICAL DAMAGE.
Other Precautions:DO NOT TAKE INTERNALLY. AVOID BREATHING DUSTS. AVOID CONTACT WITH EYES AND SKIN. KEEP OUT OF REACH OF CHILDREN. MINIMIZE DUST GENERATION AND ACCUMULATION. WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING AND DRINKING.

==== Exposure Controls/Personal Protection =====

Respiratory Protection:NONE NEEDED. IF AIRBORNE CONCENTRATIONS ARE HIGH, WEAR NIOSH-APPROVED RESPIRATOR FOR DUST OR DUST MASK.
Ventilation:USE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP FUME OR DUST LEVELS AS LOW AS POSSIBLE.
Protective Gloves:NATURAL RUBBER
Eye Protection:DUST-RESISTANT GOGGLES
Other Protective Equipment:EYEBATH, WASHING FACILITY, UNIFORM
Work Hygienic Practices:OBSERVE GOOD INDUSTRIAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES.
Supplemental Safety and Health

==== Physical/Chemical Properties =====

HCC:T4
NRC/State Lic Num:NOT RELEVANT
Spec Gravity:1.72

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Viscosity:NOT RELEVANT

Evaporation Rate & Reference:NOT RELEVANT

Solubility in Water:40% @ 20C/68F

Appearance and Odor:CLEAR, DARK RED SOLID

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

STRONG OXIDIZING AGENTS

Stability Condition to Avoid:DUST GENERATION

Hazardous Decomposition Products:TOXIC NITROGEN OXIDES, CARBON
MONOXIDE, CARBON DIOXIDE, AND SODIUM OXIDE

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE IN ACCORDANCE WITH APPLICABLE FEDERAL,
STATE & LOCAL ENVIRONMENTAL REGULATIONS. REUSING OR RECYCLING IS
RECOMMENDED.

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assume responsibility for the suitability of this information to their
particular situation.

Material Safety Data Sheet

Sodium oxalate, pure

ACC# 96509

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium oxalate, pure

Catalog Numbers: AC207720000, AC207720050, AC207721000, AC207725000

Synonyms: Ethanedioic acid, disodium salt; Oxalic acid, disodium salt; Disodium oxalate; Sodium oxalate.

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
62-76-0	Ethanedioic acid, disodium salt	> 99.5	200-550-3

Hazard Symbols: XN

Risk Phrases: 21/22

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid. May cause kidney damage. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. **Warning!** Hygroscopic (absorbs moisture from the air). Harmful in contact with skin and if swallowed. May cause eye and skin irritation with possible burns.

Target Organs: Kidneys, heart, eyes, skin, brain, nerves, mucous membranes.

Potential Health Effects

Eye: May cause eye irritation. May result in corneal injury.

Skin: Harmful if absorbed through the 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

Material Safety Data Sheets, Carver Hall RM 208-A

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 produces irritation of the respiratory tract, ulceration of the mucous membranes, headaches, 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 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.

Material Safety Data Sheets, Carver Hall RM 208-A

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Discard contaminated shoes. Use only with adequate ventilation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture. Oxalates slowly corrode steel.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethanedioic acid, disodium salt	none listed	none listed	none listed

OSHA Vacated PELs: Ethanedioic acid, disodium salt: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate 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: none reported

pH: Neutral in solution.

Vapor Pressure: Negligible.

Vapor Density: Not applicable.

Material Safety Data Sheets, Carver Hall RM 208-A

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: Decomposes

Freezing/Melting Point: 250-270 deg C (dec)

Decomposition Temperature: 250-270 deg C

Solubility: Moderately soluble in water.

Specific Gravity/Density: 2.34 (water=1)

Molecular Formula: C₂O₄Na₂

Molecular Weight: 134.00

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, dust generation, moisture, Oxalates slowly corrode steel..

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, sodium oxide, formic acid.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 62-76-0: KI1750000

LD50/LC50:

CAS# 62-76-0:

Oral, mouse: LD50 = 5094 mg/kg;

Oral, rat: LD50 = 11160 mg/kg; <BR.

Carcinogenicity:

CAS# 62-76-0: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

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.

Neurotoxicity: No information found.

Mutagenicity: No information found.

Other Studies: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Material Safety Data Sheets, Carver Hall RM 208-A

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:	TOXIC SOLIDS, ORGANIC, N.O.S.				No information available.
Hazard Class:	6.1				
UN Number:	UN2811				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 62-76-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 62-76-0: acute, chronic.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 62-76-0 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 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

SIGMA CHEMICAL COMPANY -- SO626 SODIUM PERSULFATE -- 6750-01-144-8359

===== Product Identification =====

Product ID:SO626 SODIUM PERSULFATE

MSDS Date:08/26/1997

FSC:6750

NIIN:01-144-8359

MSDS Number: CFKSK

=== Responsible Party ===

Company Name:SIGMA CHEMICAL COMPANY

Address:3050 SPRUCE ST

Box:14508

City:ST. LOUIS

State:MO

ZIP:63178

Country:US

Info Phone Num:800-325-3010/FAX 800-325-5052

Emergency Phone Num:314-771-5765

CAGE:21076

=== Contractor Identification ===

Company Name:SIGMA CHEMICAL COMPANY

Address:3050 SPRUCE ST

Material Safety Data Sheets, Carver Hall RM 208-A

Box:14508
City:ST LOUIS
State:MO
ZIP:63178
Country:US
Phone:314-771-5765
CAGE:21076

==== Composition/Information on Ingredients =====

Ingred Name:SODIUM PERSULFATE
CAS:7775-27-1
RTECS #:SE0525000
Fraction by Wt: 100%
Other REC Limits:NONE RECOMMENDED

==== 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:MAY BE HARMFUL BY INHALATION,
INGESTION OR SKIN ABSORPTION. CAUSES SKIN & EYE IRRITATION.
IRRITATING TO MUCOUS MEMBRANES & UPPER RESPIRATORY TRACT. PROLONGED
OR REPEATED EXPOSURE MAY CAUSE ALLERGIC REACTIONS IN CERTAIN
SENSITIVE PERSONS.
Explanation of Carcinogenicity:NO INGREDIENT OF A CONCENTRATION OF 0.1%
OR GREATER IS LISTED AS A CARCINOGEN OR SUSPECTED CARCINOGEN.
Effects of Overexposure:INHALED-HARMFUL, UPPER RESPIRATORY TRACT
IRRITATION. INGESTED-HARMFUL. SKIN ABSORPTION-HARMFUL. SKIN
CONTACT-IRRITATION. EYE CONTACT-IRRITATION.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

==== First Aid Measures =====

First Aid:IN ALL CASES GET MEDICAL ATTENTION. EYES-FLUSH WITH WATER FOR
15 MINUTES, LIFT. SKIN-REMOVE CONTAMINATED CLOTHES. WASH WITH MILD
SOAP & WATER. INHALED-REMOVE TO FRESH AIR. GIVE OXYGEN OR
ARTIFICIAL RESPIRATION AS NEEDED. INGESTED-IF CONSCIOUS, WASH OUT
MOUTH WITH WATER. CALL A PHYSICIAN.

==== Fire Fighting Measures =====

Extinguishing Media:WATER SPRAY.
Fire Fighting Procedures:STRONG OXIDIZER. WEAR SELF-CONTAINED BREATHING
APPARATUS AND FULL FIRE FIGHTER'S PROTECTIVE GEAR TO PREVENT
CONTACT WITH SKIN & EYES.
Unusual Fire/Explosion Hazard:CONTACT WITH OTHER MATERIAL MAY CAUSE
FIRE. EMITS TOXIC FUMES UNDER FIRE CONDITIONS. CONTAINER EXPLOSION
MAY OCCUR UNDER FIRE CONDITIONS.

==== Accidental Release Measures =====

Spill Release Procedures:EVACUATE AREA. ELIMINATE ALL SOURCES OF
IGNITION. WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS &
HEAVY RUBBER GLOVES. COVER WITH DRY LIME, SAND OR SODA ASH. PLACE
IN COVERED CONTAINERS USING NON-SPARKING TOOLS & TRANSPORT
OUTDOORS.

Material Safety Data Sheets, Carver Hall RM 208-A

Neutralizing Agent: DRY LIME OR SODA ASH.

==== Handling and Storage =====

Handling and Storage Precautions: USE ONLY IN A CHEMICAL HOOD. METALS, EXCEPT STAINLESS STEEL, MAY CAUSE DECOMPOSITION. DECOMPOSITION IS ACCELERATED BY MOISTURE & HIGH TEMPERATURES.

Other Precautions: REACTS VIOLENTLY WITH HYDRAZINE OR ORGANIC MONOMERS (INITIATES POLYMERIZATION) >

==== Exposure Controls/Personal Protection =====

Respiratory Protection: IF ENGINEERING CONTROLS FAIL OR NON-ROUTINE USE OR AN EMERGENCY OCCURS; WEAR AN MSHA/NIOSH APPROVED RESPIRATOR OR AN AIR-SUPPLIED RESPIRATOR OR SCBA, AS REQUIRED. USE IAW 29 CFR 1910.134.

Ventilation: USE ONLY IN A CHEMICAL FUME HOOD.

Protective Gloves: CHEMICAL-RESISTANT GLOVES.

Eye Protection: CHEMICAL SPLASH GOGGLES.

Other Protective Equipment: DLA-HMIS-EYE WASH STATION & SAFETY SHOWER. RUBBER APRON.

Work Hygienic Practices: WASH HANDS AFTER HANDLING AND BEFORE EATING, DRINKING, OR SMOKING. LAUNDER CONTAMINATED CLOTHES BEFORE REUSE.

Supplemental Safety and Health

==== Physical/Chemical Properties =====

HCC: D1

Spec Gravity: 2.400

Appearance and Odor: WHITE CRYSTALLINE POWDER.

==== Stability and Reactivity Data =====

STRONG REDUCING AGENTS, FINELY POWDERED METALS, STRONG BASES, PROTECT FROM MOISTURE, ALCOHOLS.

Stability Condition to Avoid: NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products: SULFUR OXIDES.

==== Disposal Considerations =====

Waste Disposal Methods: DISPOSE OF IAW LOCAL, STATE & FEDERAL REGULATIONS. ACIDIFY 3% SOLUTION/SUSPENSION OF MATERIAL TO PH2 W/SULFURIC ACID, THEN ADD 50% EXCESS SODIUM BISULFITE WHILE STIRRING. IF MN, CR OR MB PRESENT ADJUST PH TO 7 & DISPOSE OF AS HAZARDOUS WASTE.

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WGK (Water Danger/Protection)

CAS# 62-76-0: 1

Material Safety Data Sheets, Carver Hall RM 208-A

Canada - DSL/NDSL

CAS# 62-76-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B, D1B.

Canadian Ingredient Disclosure List

Exposure Limits

Material Safety Data Sheets, Carver Hall RM 208-A

EMS CATALOG NO: 21180
EMS PRODUCT: Sodium Phosphate
Diabasic
DATE: 11/14/95
PAGE NUMBER: One of 4

MATERIAL SAFETY DATA SHEET

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

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(215) 646-1566 CHEMTREC: (800) 424-9300

FOR PRODUCT AND SALES INFORMATION

CONTACT ELECTRON MICROSCOPY SCIENCES OFFICE ABOVE.

PRODUCT IDENTIFICATION

PRODUCT NAME: Sodium Phosphate Dibasic Heptahydrate

CAS NUMBER: 07782-85-6

COMMON OR TRADE NAME: Disodium Phosphate

HMIS CODE: H-1, F-0, R-0, P-B

CHEMICAL FORMULA: $\text{Na}_2\text{HPO}_4 \cdot 7\text{H}_2\text{O}$

MOLECULAR WEIGHT: 268.1

* * * EMS CATALOG NO: 21180 * * * (Page 2 of 4)

HAZARDOUS INGREDIENTS

Material Safety Data Sheets, Carver Hall RM 208-A

COMPONENT % OSHA PEL ACGIH TLV OTHER

Disodium hydrogen 98 N/E N/E N/E
phosphate neptahydrate

PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: Not applicable
SPECIFIC GRAVITY (H2O=1): 1.68
VAPOR PRESSURE (mm Hg): Not applicable
VAPOR DENSITY (AIR=1): Not applicable
MELTING POINT: Loses water at 92.5oC
SOLUBILITY IN WATER: 1 g/4 ml
EVAPORATION RATE (Butyl Acetate=1): Not applicable
APPEARANCE AND ODOR: White, odorless crystals

FIRE AND EXPLOSION HAZARD DATA

FIRE HAZARD RATING: Minimal, non-flammable

FLASH POINT: Not applicable

METHOD: Not applicable

FLAMMABLE LIMITS: LEL: Not applicable

UEL: Not applicable

EXTINGUISHING MEDIA: Not applicable

SPECIAL FIRE

FIGHTING PROCEDURES: Not applicable

UNUSUAL FIRE

AND EXPLOSION HAZARDS: Not applicable

REACTIVITY DATA

REACTIVITY HAZARD RATING: Minimal, non-reactive

STABILITY: Stable

CONDITIONS TO AVOID: Prolonged storage

* * * EMS CATALOG NO: 21180 * * * (Page 3 of 4)

INCOMPATIBILITY (MATERIALS TO AVOID): None known

HAZARDOUS DECOMPOSITION OR BY PRODUCTS: None known

HAZARDOUS POLYMERIZATION: Will not occur

Material Safety Data Sheets, Carver Hall RM 208-A

CONDITIONS TO AVOID: None known

HEALTH HAZARD DATA

HEALTH HAZARD RATING: Slight. Mild eye irritant.

ROUTE(S) OF ENTRY:

INHALATION?: Yes

INGESTION?: Yes

SKIN?: No

HEALTH HAZARDS (ACUTE AND CHRONIC):

Eye irritant. Respiratory system hazard, acute and chronic.

CARCINOGENICITY:

NTP?: No

IARC MONOGRAPHS?: No

OSHA REGULATED?: No

SIGNS AND SYMPTOMS OF EXPOSURE:

Contact with eyes causes redness and irritation. Inhalation of dusts, mists or aerosols may cause irritation of the respiratory tract. Ingestion may cause unknown effects. Effects of repeated low level exposures are unknown.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

None known

EMERGENCY AND FIRST AID PROCEDURES:

EYE(S): Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes.

SKIN: Remove product and flush affected area with water.

INHALATION: Move patient to fresh air. Call a physician.

* * * EMS CATALOG NO: 21180 * * * (Page 4 of 4)

INGESTION: If swallowed, call a physician immediately. Induce vomiting only as directed by medical personnel. Never give anything by mouth to an unconscious person.

PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Material Safety Data Sheets, Carver Hall RM 208-A

Shovel spilled chemical product into dry container for later disposal or recovery. Remove from the spill location. Flush area with water.

WASTE DISPOSAL METHOD:

Flush to industrial sewer with large amount of water. Comply with all Federal, State, and Local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

No special precautions required.

OTHER PRECAUTIONS: No special precautions required.

CONTROL MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE):

Not generally required. NIOSH approved particulate respirator.

VENTILATION: Adequate general and local exhaust.

SPECIAL: No

OTHER: No

EYE PROTECTION: Chemical safety goggles

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

Eye wash stations readily accessible. Safety shower. Barrier creams.

WORK/HYGIENIC PRACTICES:

Wash at the end of each workshift and before eating, smoking or using the toilet. Wash promptly if skin becomes contaminated.

N/E None established

Material Safety Data Sheet
Sodium phosphate, dibasic anhydrous, reagent ACS

ACC# 00744

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium phosphate, dibasic anhydrous, reagent ACS

Catalog Numbers: AC424370000, AC424375000

Synonyms: Phosphoric acid, disodium salt; Sodium orthophosphate, dibasic.

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
7558-79-4	Disodium hydrogen phosphate	100	231-448-7

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! Causes mild eye irritation. Causes mild skin irritation. May cause respiratory tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: Causes mild eye irritation. May cause chemical conjunctivitis.

Skin: Causes mild skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation. Can produce delayed pulmonary edema.

Chronic: Effects may be delayed. None

Section 4 - First Aid Measures

Material Safety Data Sheets, Carver Hall RM 208-A

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use extinguishing media appropriate to the surrounding fire.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

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
Disodium hydrogen phosphate	none listed	none listed	none listed

OSHA Vacated PELs: Disodium hydrogen phosphate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 8.7-9.3 (Solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: 118 deg F

Decomposition Temperature: Not available.

Solubility: 104% @ 40C for water.

Specific Gravity/Density: 1.67 (Water=1)

Molecular Formula: Na₂HPO₄

Molecular Weight: 141.958

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, exposure to air, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong bases.

Hazardous Decomposition Products: Oxides of phosphorus, irritating and toxic fumes and gases, sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7558-79-4: WC4500000

LD50/LC50:

CAS# 7558-79-4:

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 500 mg/24H Mild;

Oral, rat: LD50 = 17 gm/kg;

Carcinogenicity:

CAS# 7558-79-4: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

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# 7558-79-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7558-79-4: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7558-79-4 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7558-79-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

Material Safety Data Sheets, Carver Hall RM 208-A

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7558-79-4: 1

Canada - DSL/NDSL

CAS# 7558-79-4 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet
Sodium phosphate monobasic anhydrous

ACC# 15190

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium phosphate monobasic anhydrous

Catalog Numbers: S93378, BP329-1, BP329-500, S397-12, S397-212, S397-500

Synonyms: Sodium dihydrogen phosphate; Sodium acid phosphate; Sodium biphosphate anhydrous.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7558-80-7	Sodium phosphate monobasic, anhydrous	100	231-449-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: Eyes.

Potential Health Effects

Eye: Causes mild 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: 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 if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use agent most appropriate to extinguish fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. 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 prolonged or repeated contact with skin. Avoid contact with 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: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium phosphate monobasic, anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Sodium phosphate monobasic, anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: 4.1-4.5: 5% solution

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 203.9 deg C

Freezing/Melting Point: 100 deg C

Decomposition Temperature: 203.9 deg C

Solubility: 59.9%

Specific Gravity/Density: 2.04

Molecular Formula: NaH₂PO₄

Molecular Weight: 119.98

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable.

Conditions to Avoid: Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, oxides of phosphorus, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7558-80-7: WA1900000

LD50/LC50:

CAS# 7558-80-7:

Draize test, rabbit, eye: 150 mg Mild;

Oral, rat: LD50 = 8290 mg/kg;

Carcinogenicity:

CAS# 7558-80-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7558-80-7 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# 7558-80-7 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.

Material Safety Data Sheets, Carver Hall RM 208-A

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7558-80-7: 1

Canada - DSL/NDSL

CAS# 7558-80-7 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
Potassium sodium tartrate tetrahydrate

ACC# 21570

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium sodium tartrate tetrahydrate

Catalog Numbers: AC202860000, AC202860050, 20286-0010, 20286-5000, S386-12, S386-212, S386-500, S387-10, S387-3, S387-500

Synonyms: Sodium potassium tartrate tetrahydrate; Rochelle salt; Seignette salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
6381-59-5	Tartrate, potassium sodium	>99	206-156-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye, skin, and respiratory tract irritation.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. May be harmful if absorbed through the skin.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Material Safety Data Sheets, Carver Hall RM 208-A

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tartrate, potassium sodium	none listed	none listed	none listed
Butanedioic acid, 2,3-dihydroxy-[R-(R*,R*)]-, monopotassium	none listed	none listed	none listed

OSHA Vacated PELs: Tartrate, potassium sodium: No OSHA Vacated PELs are listed for this chemical. Butanedioic acid, 2,3-dihydroxy-[R-(R*,R*)]-, monopotassium: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: none reported

pH: 5.5-8.5 (5% aq.sol. 20°C)

Vapor Pressure: Not available.

Vapor Density: Not applicable.

Evaporation Rate: Negligible

Viscosity: No data

Boiling Point: 220 deg C

Freezing/Melting Point: 70 - 80 deg C

Decomposition Temperature: 220 deg C

Solubility: 630 g/l (20°C)

Specific Gravity/Density: Not available.

Molecular Formula: NaKC4H4O6.4H2O

Molecular Weight: 282.22

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, dust generation.

Incompatibilities with Other Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, sodium oxide, oxides of potassium.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 6381-59-5 unlisted.

CAS# 304-59-6 unlisted.

LD50/LC50:

Not available.

Not available.

Carcinogenicity:

CAS# 6381-59-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 304-59-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated.	Not Regulated.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6381-59-5 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 304-59-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 6381-59-5: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 6381-59-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 304-59-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

Material Safety Data Sheets, Carver Hall RM 208-A

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 6381-59-5: 0

CAS# 304-59-6: 1

Canada - DSL/NDSL

CAS# 304-59-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

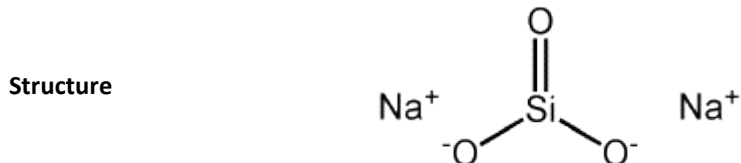
Canadian Ingredient Disclosure List

Material Safety Data Sheets, Carver Hall RM 208-A

Sodium silicate

- Silicic acid, sodium salt
- Sodium silicate
- Soluble glass
- Waterglass

Formula Na_2SiO_3



Description A powdered or flaked solid.

Uses Lining bessemer converters, acid concentrators, manufacture grindstones, abrasive wheels (as binder only).

Registry Numbers and Inventories.

CAS 1344-09-8

NIH PubChem CID 23266

EC (EINECS/ELINCS) 215-687-4

RTECS VV9365000

RTECS class Primary Irritant

UN (DOT) 1759

Beilstein/Gmelin 19151 (G)

EPA OPP 72603

Swiss Giftliste 1 G-8095

Material Safety Data Sheets, Carver Hall RM 208-A

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	Na ₂ O ₃ Si
Formula mass	122.06
Vapor pressure, mm _{Hg}	18
Density	1.37 g/cm ³
Solubility in water	Slightly soluble
Viscosity	10 P (1088 C)
Refractive index	1.512 - 1.514
Thermal expansion	0.000022/K

Hazards and Protection.

Storage	Store in a cool, dry location in a sealed 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

Material Safety Data Sheets, Carver Hall RM 208-A

be observed.

Protection	Wear appropriate protective gloves, clothing and goggles.
Respirators	Wear positive pressure self-contained breathing apparatus (SCBA).
Small spills/leaks	Build dikes to contain flow as necessary. Neutralize spilled material with crushed limestone, soda ash, or lime.
Stability	Stable.Stable at normal temperatures and pressures.
Incompatibilities	Reacts violently with fluorine. Avoid contact with: acids, reactive metals such as aluminum and magnesium, zinc.
Decomposition	Silicates.

Fire.

Fire fighting	Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Use water in flooding quantities as fog. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible.
Fire potential	Flammable solid.
Hazards	Oxides from metallic fires are a severe health hazard. Fire may produce irritating, corrosive and/or toxic gases.
Combustion products	Fire may produce irritating, corrosive and/or toxic gases.

Health.

Poison_Class 3

Exposure effects

Ingestion

Burns of the esophagus and less commonly the stomach may occur after caustic ingestion; the absence of oral mucosal injury does not reliably exclude esophageal burns. Patients with stridor, drooling or vomiting are more likely to have esophageal burns.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation Stridor, dyspnea, upper airway injury, and pulmonary edema, especially following inhalation of vaporized caustics, may occur.

Skin Severe skin irritation and/or burns may occur.

Eyes See Inhalation.

First aid

Ingestion Mucosal if no respiratory compromise is present, dilute immediately with milk or water; no more than 8 ounces in adults and 4 ounces in children. Gastric ipecac contraindicated. Consider insertion of a small, flexible nasogastric or orogastric tube to suction gastric contents after recent large ingestions; the risk of further mucosal injury must be weighed against potential benefits.

Inhalation Move patient to fresh air. Monitor for respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer oxygen and assist ventilation as required. Treat bronchospasm with beta2 agonist and corticosteroid aerosols.

Skin Remove contaminated clothes. Irrigate exposed skin with copious amounts of water for at least 15 minutes or longer, depending on concentration, amount and duration of exposure to the chemical. A physician may need to examine the area if irritation or pain persist.

Eyes Home irrigation - exposed eyes should be irrigated with copious amounts of water for at least 30 minutes. An examination should always be performed. Ophthalmologic consultation should be obtained. Medical facility: irrigate with sterile 0.9% Saline for at least an hour or until the cul-de-sacs are free of particulate matter and returned to neutrality (confirm with pH paper).

Transportation.

UN number 1759

Response guide [154](#)

Hazard class 8



Material Safety Data Sheets, Carver Hall RM 208-A

Packing Group	I; II; III
USCG CHRIS Code	SSN - solution, SSC
<u>USCG Compatatibility Group</u>	43 Misc. water solutions
Std. Transport #	4932328 4931413
IMO Pollution Category	C
IMO Hazard code	P

Material Safety Data Sheet

Sodium sulfate anhydrous

ACC# 21630

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium sulfate anhydrous

Catalog Numbers: AC196640000, AC196640010, AC196640025, AC196640050, AC196640250, AC196640251, AC218750000, AC218750250, AC219260000, AC219260010, AC219260025, AC325600000, AC354250000, AC424410000, AC424410030, AC424410050, 21875-5000, 35425-0010, 42441-0010, BP354-500, NC9084721, NC9130094, NC9146518, NC9260017, NC9327716, NC9369056, S415-1, S415-10, S415-10S, S415-200LB, S415-212, S415-500, S415500LC, S415J500, S420-10, S420-3, S421-1, S421-10, S421-3, S421-300LB, S421-50, S421-500, S42110LC, S42150LC, S429-12, S429-212, S429-250LB, S429-500, S43112, S434-12, S78859-4

Synonyms: Bisodium sulfate; Dibasic sodium sulfate; Disodium monosulfate; Disodium sulfate; Sodium sulphate; Sulfuric acid, disodium salt.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7757-82-6	Sodium sulfate	99	231-820-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white powder.

Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air). The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Material Safety Data Sheets, Carver Hall RM 208-A

Eye: May cause eye irritation. Causes redness and pain.

Skin: May cause skin irritation. May cause an allergic reaction in certain individuals.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: May cause respiratory tract irritation. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Substance is noncombustible.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing.

Storage: Store in a cool, dry place. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium sulfate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium sulfate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Powder

Appearance: white

Odor: odorless

pH: 5-8 (5% solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 1700 deg C

Freezing/Melting Point: 880 - 888 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 2.68 g/cm³

Molecular Formula: Na₂SO₄

Molecular Weight: 142.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, aluminum, magnesium.

Hazardous Decomposition Products: Oxides of sulfur, sodium oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7757-82-6: WE1650000

LD50/LC50:

CAS# 7757-82-6:

Oral, mouse: LD50 = 5989 mg/kg;

Carcinogenicity:

CAS# 7757-82-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: Oral, mouse: TDLo = 14 gm/kg (female 8-12 day(s) after conception) Effects on Newborn - other neonatal measures or effects.; Parenteral, mouse: TDLo = 60 mg/kg (female 8 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) and Specific Developmental Abnormalities - musculoskeletal system.

Reproductive Effects: No information found

Mutagenicity: Mutagenic effects have occurred in experimental animals.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 12,750 ppm; 96 Hr; Static bioassay Water flea Daphnia: LC50 = 4547 mg/L; 96 Hr; Unspecified Fish: Fathead Minnow: LC50 = 13,500-14,000 mg/L; 24 - 96 Hr; Unspecified Fish: Mosquito Fish: LC50 = 17,500 mg/L; 96 Hr; Unspecified This chemical is not expected to cause oxygen depletion in aquatic systems. It has a low potential to affect aquatic organisms and is expected to have a low potential to affect secondary waste treatment microorganisms.

Environmental: Sodium sulfate may persist indefinitely in the environment, but is not likely to show bioaccumulation or food chain contamination effects. If diluted with water, this chemical released directly or indirectly into the environment is not expected to have a significant impact.

Material Safety Data Sheets, Carver Hall RM 208-A

Physical: No information available.

Other: This chemical is not likely to bioconcentrate.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7757-82-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

Material Safety Data Sheets, Carver Hall RM 208-A

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7757-82-6 can be found on the following state right to know lists: Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 7757-82-6: 0

Canada - DSL/NDSL

CAS# 7757-82-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheet

Sodium sulfhydrate

ACC# 21280

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium sulfhydrate

Catalog Numbers: S423-500

Synonyms: Sodium bisulfide; Sodium hydrogen sulfide; Sodium hydrosulfide; Sodium mercaptan; Sodium mercaptide; Sodium sulfhydrate; Sodium sulfide.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
16721-80-5	Sodium sulfhydrate	74	240-778-0
7732-18-5	Water	<25	231-791-2
1344-08-7	Sodium sulfide	1.5	215-686-9
7772-98-7	Sodium thiosulfate	0.4	231-867-5
497-19-8	Sodium carbonate anhydrous	0.3	207-838-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to yellow flakes. Flash Point: 90 deg C.

Danger! Causes eye and skin burns. Pyrophoric. Spontaneously flammable in air. Contact with acids liberates toxic gas. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: Eyes, skin, mucous membranes.

Potential Health Effects

Material Safety Data Sheets, Carver Hall RM 208-A

Eye: Causes eye burns. May cause chemical conjunctivitis and corneal damage.

Skin: Causes skin burns. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause perforation of the digestive tract. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. Mercaptans may cause nausea and headache. Exposure to high concentrations of mercaptans can produce unconsciousness with cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), cold extremities and rapid pulse. May cause systemic effects.

Inhalation: Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. Aspiration may lead to pulmonary edema. May cause systemic effects. Exposure to high concentrations of mercaptans can produce unconsciousness with cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), cold extremities and rapid pulse. Mercaptans may cause nausea and headache.

Chronic: Effects may be delayed.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. May burn with invisible flame. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Spontaneously ignitable in air.

Extinguishing Media: Use dry sand or earth to smother fire. Use foam, dry chemical, or carbon dioxide. Contact professional fire-fighters immediately.

Flash Point: 90 deg C (194.00 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:4.3

Upper: 45.5

NFPA Rating: (estimated) Health: 3; Flammability: 4; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Remove all sources of ignition. Isolate area and deny entry. Provide ventilation. Place under an inert atmosphere. Do not use combustible materials such as paper towels to clean up spill.

Section 7 - Handling and Storage

Handling: Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Use spark-proof tools and explosion proof equipment. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Handle under an inert atmosphere. Do not allow contact with water. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids. Do not expose to air. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sodium sulfhydate	none listed	none listed	none listed
Water	none listed	none listed	none listed
Sodium sulfide	none listed	none listed	none listed
Sodium thiosulfate	none listed	none listed	none listed
Sodium carbonate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Sodium sulfhydate: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical. Sodium sulfide: No OSHA Vacated PELs are listed for this chemical. Sodium thiosulfate: No OSHA Vacated PELs are listed for this chemical. Sodium carbonate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Material Safety Data Sheets, Carver Hall RM 208-A

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Flakes

Appearance: white to yellow

Odor: rotten egg-like - mild odor

pH: Alkaline in solution

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: 164.4 deg C

Freezing/Melting Point: 52.2 deg C

Decomposition Temperature: Not available.

Solubility: Completely soluble in water.

Specific Gravity/Density: Not available.

Molecular Formula: NaSH

Molecular Weight: 56.07

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Powder or liquid is pyrophoric.

Conditions to Avoid: Ignition sources, dust generation, moisture, exposure to air.

Incompatibilities with Other Materials: Acids, metals.

Hazardous Decomposition Products: Oxides of sulfur, hydrogen sulfide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 16721-80-5: WE1900000

CAS# 7732-18-5: ZC0110000

CAS# 1344-08-7 unlisted.

CAS# 7772-98-7: XN6476000

CAS# 497-19-8: VZ4050000

Material Safety Data Sheets, Carver Hall RM 208-A

LD50/LC50:

Not available.

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 1344-08-7:

CAS# 7772-98-7:

CAS# 497-19-8:

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, eye: 50 mg Severe;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, mouse: LC50 = 1200 mg/m³/2H;

Inhalation, rat: LC50 = 2300 mg/m³/2H;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, rat: LD50 = 4090 mg/kg;

Carcinogenicity:

CAS# 16721-80-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 1344-08-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7772-98-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 497-19-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: See actual entry in RTECS for complete information.

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

Material Safety Data Sheets, Carver Hall RM 208-A

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	SODIUM HYDROSULFIDE	No information available.
Hazard Class:	4.2	
UN Number:	UN2318	
Packing Group:	II	

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 16721-80-5 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 1344-08-7 is listed on the TSCA inventory.

CAS# 7772-98-7 is listed on the TSCA inventory.

CAS# 497-19-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 16721-80-5: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 16721-80-5: immediate, delayed, reactive.

CAS # 497-19-8: immediate.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 16721-80-5 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 16721-80-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 1344-08-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7772-98-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 497-19-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 31 Contact with acids liberates toxic gas.

R 34 Causes burns.

R 7 May cause fire.

Safety Phrases:

S 25 Avoid contact with eyes.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 50A Do not mix with acids.

WGK (Water Danger/Protection)

CAS# 16721-80-5: 2

CAS# 7732-18-5: No information available.

CAS# 1344-08-7: No information available.

CAS# 7772-98-7: 0

CAS# 497-19-8: 1

Canada - DSL/NDSL

CAS# 16721-80-5 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 1344-08-7 is listed on Canada's DSL List.

CAS# 7772-98-7 is listed on Canada's DSL List.

CAS# 497-19-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 16721-80-5 is listed on the Canadian Ingredient Disclosure List.

CAS# 497-19-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Sodium Tartrate Dihydrate Water Standard

ACC# 91607

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium Tartrate Dihydrate Water Standard

Catalog Numbers: BP2770-100

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
6106-24-7	Sodium Tartrate Dihydrate	ca. 100%	unlisted

Hazard Symbols: None listed.

Risk Phrases: None listed.

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder. **Caution!** The toxicological properties of this material have not been fully investigated. May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause 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

Material Safety Data Sheets, Carver Hall RM 208-A

been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Runoff from fire control or dilution water may cause pollution.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Material Safety Data Sheets, Carver Hall RM 208-A

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
Sodium Tartrate Dihydrate	none listed	none listed	none listed

OSHA Vacated PELs: Sodium Tartrate Dihydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: Crystalline powder

Appearance: white

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: Not available.

Specific Gravity/Density: Not available.

Molecular Formula: Not available.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, dust generation, excess heat, strong oxidants.

Incompatibilities with Other Materials: 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# 6106-24-7 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 6106-24-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 6106-24-7 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)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the 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

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

Material Safety Data Sheets, Carver Hall RM 208-A

CAS# 6106-24-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

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# 6106-24-7: 1

Canada - DSL/NDSL

None of the chemicals in this product are listed on the DSL or NDSL list. **Canada - WHMIS**

WHMIS: Not available.

Canadian Ingredient Disclosure List

Exposure Limits

Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC -- SODIUM TETRABORATE DECAHYDRATE 21010, S246500 -- 6810-00N090648

=====
Product Identification
=====

Product ID:SODIUM TETRABORATE DECAHYDRATE 21010, S246500

MSDS Date:12/12/1997

FSC:6810

NIIN:00N090648

Status Code:A

MSDS Number: CJBXV

=== Responsible Party ===

Company Name:FISHER SCIENTIFIC

Address:1 REAGENT LANE

City:FAIRLAWN

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:SODIUM TETRABORATE DECAHYDRATE

CAS:1303-96-4

RTECS #:VZ2275000

Fraction by Wt: 100%

OSHA PEL:10 MG/M3

ACGIH TLV:5 MG/M3

=====
Hazards Identification
=====

LD50 LC50 Mixture:LD50 (ORAL RAT): 2660 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: EYES: DUST MAY CAUSE MECH

IRRIT. SKIN: MAY CAUSE IRRIT. LOW HAZ FOR USUAL INDUS HNDLG.

INGEST: SYMPS MAY INCL HDCH, EXCITEMENT, FATG, NAUS, VOMIT, STUPOR,
& COMA. MAY CAUSE GI IRRIT W/NAUS, VOM IT & DIARR. MAY CAUSE KIDNEY
DMG. MAY CAUSE CNS DEPRESS INCL EXCITEMENT, FOLLOWED BY HDCH, DIZZ,
DROW, (EFTS OF OVEREXP)

Explanation of Carcinogenicity:NOT RELEVANT.

Effects of Overexposure:HLTH HAZ: & NAUS. ADVANCED STAGES MAY CAUSE

COLLAPSE, UNCON, COMA & POSS DEATH DUE TO RESP FAILURE. INHAL: LOW
HAZ FOR USUAL INDUS HNDLG. INHAL OF DUST MAY CAUSE RESP TRACT

IRRIT. MAY CAUSE BLOOD ABNO RMS. CHRONIC: CHRONIC INGEST MAY CAUSE
EFTS SIMILAR TO THOSE OF ACUTE INGEST. TARGET ORGANS: KIDNEYS, CNS.

Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures
=====

Material Safety Data Sheets, Carver Hall RM 208-A

First Aid:EYES: FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MINS, OCCAS
LIFTING UPPER & LOWER LIDS. GET MED AID. SKIN: GET MED AID IF IRRIT
DEVELOPS/PERSISTS. FLUSH W/PLENTY OF SOAP & WATER. INGEST: IF
CONSCIOUS & ALERT, GIVE 2-4 CUPFULS OF MILK/WATER. NEVER GIVE
ANYTHING BY MOUTH TO AN UNCON PERS. GET MED AID IMMED. INHAL:
REMOVE TO FRESH AIR IMMED. GET MED AID IF COUGH/OTHER SYMPS APPEAR.
NOTES TO MD: NONE.

===== Fire Fighting Measures =====

Extinguishing Media:USE WATER SPRAY, DRY CHEMICAL, CARBON DIOXIDE, OR
CHEMICAL FOAM.

Fire Fighting Procedures:WEAR NIOSH APPROVED SCBA AND FULL PROTECTIVE
EQUIPMENT .

Unusual Fire/Explosion Hazard:NONE SPECIFIED BY MANUFACTURER.

===== Accidental Release Measures =====

Spill Release Procedures:USE PROPER PERSONAL PROTECTIVE EQUIPMENT AS
INDICATED. SWEEP UP, THEN PLACE INTO A SUITABLE CONTAINER FOR
DISPOSAL. AVOID GENERATING DUSTY CONDITIONS.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:USE WITH ADEQUATE VENTILATION.
MINIMIZE DUST GENERATION AND ACCUMULATION. AVOID CONTACT WITH EYES,
SKIN, AND CLOTHING.

Other Precautions:AVOID INGESTION AND INHALATION. STORE IN A TIGHTLY
CLOSED CONTAINER. STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY
FROM INCOMPATIBLE SUBSTANCES.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:FOLLOW THE OSHA RESPIRATOR REGULATIONS FOUND IN
29 CFR 1910.134 OR EUROPEAN STANDARD EN 149. ALWAYS USE A NIOSH OR
EUROPEAN STANDARD EN 149 APPROVED RESPIRATOR WHEN NECESSARY.

Ventilation:USE ADEQUATE VENTILATION TO KEEP AIRBORNE CONCENTRATIONS
LOW.

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPRVD CHEM WORKERS GOGGLES .

Other Protective Equipment:EMERGENCY EYEWASH AND DELUGE SHOWER MEETING
ANSI DESIGN CRITERIA . WEAR APPROPRIATE PROTECTIVE CLOTHING.

Work Hygienic Practices:WASH THOROUGHLY AFTER HANDLING.

Supplemental Safety and Health
NONE SPECIFIED BY MANUFACTURER.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:2867F,1575C

Melt/Freeze Pt:M.P/F.P Text:608F,320C

Spec Gravity:1.73

Solubility in Water:SOLUBLE

Appearance and Odor:WHITE SOLID, ODORLESS.

===== Stability and Reactivity Data =====

Material Safety Data Sheets, Carver Hall RM 208-A

Stability Indicator/Materials to Avoid: YES

NONE REPORTED.

Stability Condition to Avoid: DUST GENERATION.

Hazardous Decomposition Products: TOXIC FUMES OF SODIUM OXIDE, OXIDES OF CARBON.

=====
===== Disposal Considerations =====

Waste Disposal Methods: DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

Disclaimer (provided with this information by the compiling agencies):
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Material Safety Data Sheet

Sodium thiocyanate

ACC# 21700

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium thiocyanate

Catalog Numbers: AC196760000, AC196762500, AC196765000, AC419670000, AC419670030, AC419670050, AC419675000, S441-500, S441-500LC

Synonyms: Sodium thiocyanate; Sodium rhodanide; Sodium sulfocyanate.

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
540-72-7	Sodium thiocyanate	98+	208-754-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Warning! Harmful to aquatic organisms; may cause long-term adverse effects in the aquatic environment. Harmful if swallowed, inhaled, or absorbed through the skin. Contact with acids liberates toxic gas. Hygroscopic (absorbs moisture from the air).

Target Organs: Central nervous system, cardiovascular system, thyroid, skin.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause 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: 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: 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.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Use only in a chemical fume hood.

Storage: Store in a cool, dry place. Store in a tightly closed container. 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
Sodium thiocyanate	none listed	none listed	5 mg/m ³ TWA (listed under Cyanide anion).

OSHA Vacated PELs: Sodium thiocyanate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: Crystals

Appearance: white

Odor: Odorless

pH: 5.5 - 7.5 (5%aq.sol. 20°C)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Decomposes

Freezing/Melting Point: 287 deg C

Decomposition Temperature: Not available.

Solubility: 1390g/l (20°C)

Specific Gravity/Density: >1.0

Molecular Formula: NaSCN

Molecular Weight: 81.06

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Light sensitive. Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, light, dust generation, moisture.

Incompatibilities with Other Materials: Strong oxidizing agents, acids.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, oxides of sulfur, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 540-72-7: XL2275000

LD50/LC50:

CAS# 540-72-7:

Oral, mouse: LD50 = 362 mg/kg;

Oral, mouse: LD50 = 360 mg/kg;

Oral, mouse: LD50 = 809 mg/kg;

Oral, rat: LD50 = 764 mg/kg;

Oral, rat: LD50 = 1180 mg/kg;

Oral, rat: LD50 = 232 mg/kg;

Oral, rat: LD50 = 837 mg/kg;

Data on potassium thiocyanate, a very similar chemical: Human oral TDLo: 428 mg/kg, toxic psychosis, hallucinations, distorted perceptions, gastritis. Human oral LDLo: 80 mg/kg, hallucinations, distorted perceptions, convulsions, muscle weakness. Rabbit oral LDLo: 500 mg/kg. Guinea pig oral LDLo: 600 mg/kg. Frog oral LDLo: 300 mg/kg.

Carcinogenicity:

CAS# 540-72-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: No information found

Neurotoxicity: No information found

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure 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# 540-72-7 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 540-72-7: 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. CAS# 540-

Material Safety Data Sheets, Carver Hall RM 208-A

72-7 is listed as a Priority Pollutant under the Clean Water Act. CAS# 540-72-7 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# 540-72-7 can be found on the following state right to know lists: California, (listed as Cyanides, inorganic salts), New Jersey, (listed as Cyanide anion), New Jersey, (listed as Cyanides, inorganic salts), Pennsylvania, (listed as Cyanide anion), Massachusetts, (listed as Cyanide anion).

California Prop 65

California No 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 32 Contact with acids liberates very toxic gas.

R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 13 Keep away from food, drink and animal feeding stuffs.

S 36/37 Wear suitable protective clothing and gloves.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

S 50A Do not mix with acids.

WGK (Water Danger/Protection)

CAS# 540-72-7: 1

Canada - DSL/NDSL

CAS# 540-72-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 540-72-7 (listed as Cyanides, inorganic salts) is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Sodium thiosulfate 0.1576N

ACC# 89056

Section 1 - Chemical Product and Company Identification

MSDS Name: Sodium thiosulfate 0.1576N

Catalog Numbers: SLN8856

Synonyms: None.

Company Identification:

Fisher Scientific

1 Reagent Lane

Material Safety Data Sheets, Carver Hall RM 208-A

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	96.07	231-791-2
7772-98-7	Sodium thiosulfate	3.91	231-867-5
497-19-8	Sodium carbonate anhydrous	0.02	207-838-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid.

Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual industrial handling.

Target Organs: No data found.

Potential Health Effects

Eye: May cause mild eye irritation.

Skin: May cause skin irritation.

Ingestion: Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation: May cause respiratory tract irritation. Low hazard for usual industrial handling.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial

Material Safety Data Sheets, Carver Hall RM 208-A

respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: For small fires, use 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: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Handling: Avoid prolonged or repeated contact with skin. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	none listed	none listed	none listed
Sodium thiosulfate	none listed	none listed	none listed

Material Safety Data Sheets, Carver Hall RM 208-A

Sodium carbonate anhydrous	none listed	none listed	none listed
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OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Sodium thiosulfate: No OSHA Vacated PELs are listed for this chemical. Sodium carbonate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate 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: none reported

pH: Not available.

Vapor Pressure: 14 mm Hg

Vapor Density: Not available.

Evaporation Rate: >1 (ether=1)

Viscosity: Not available.

Boiling Point: 100 deg C

Freezing/Melting Point: 0 deg C

Decomposition Temperature: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 1.0-1.1

Molecular Formula: Mixture

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Excess heat.

Incompatibilities with Other Materials: Sodium thiosulfate violently reacts with sodium nitrite. It is also incompatible with strong oxidizers, acids.

Hazardous Decomposition Products: Hydrogen sulfide, sodium oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

Material Safety Data Sheets, Carver Hall RM 208-A

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 7772-98-7: XN6476000

CAS# 497-19-8: VZ4050000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 7772-98-7:

CAS# 497-19-8:

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, eye: 50 mg Severe;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, mouse: LC50 = 1200 mg/m³/2H;

Inhalation, rat: LC50 = 2300 mg/m³/2H;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, mouse: LD50 = 6600 mg/kg;

Oral, rat: LD50 = 4090 mg/kg;

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7772-98-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 497-19-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found

Teratogenicity: No information found

Reproductive Effects: No information found

Mutagenicity: 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.

Material Safety Data Sheets, Carver Hall RM 208-A

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 7772-98-7 is listed on the TSCA inventory.

CAS# 497-19-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

SARA Codes

CAS # 497-19-8: immediate.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

Material Safety Data Sheets, Carver Hall RM 208-A

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7772-98-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 497-19-8 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 7772-98-7: 0

CAS# 497-19-8: 1

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 7772-98-7 is listed on Canada's DSL List.

CAS# 497-19-8 is listed on Canada's DSL List.

Canada - WHMIS

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# 497-19-8 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Tin(II) chloride

ACC# 21840

Section 1 - Chemical Product and Company Identification

MSDS Name: Tin(II) chloride

Catalog Numbers: AC196980000, AC196980250, AC196981000, AC196985000, T141-100, T141-500

Synonyms: Stannous 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
7772-99-8	Tin(II) chloride	98+	231-868-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystalline powder.

Danger! Causes burns by all exposure routes. Harmful if swallowed. Hygroscopic (absorbs moisture from the air). May cause sensitization by skin contact.

Target Organs: Blood, kidneys, liver, 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. May cause sensitization by skin contact.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns. Inorganic tin salts may cause systemic toxic effects on the central nervous system, heart, and

Inhalation: Causes chemical burns to the respiratory tract. May be harmful if inhaled.

Chronic: Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage.

Material Safety Data Sheets, Carver Hall RM 208-A

Adverse reproductive effects have been reported in animals. Chronic exposure may cause blood effects. Repeated or prolonged exposure may cause allergic reactions in sensitive individuals. Animal studies have reported the development of tumors.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid 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: 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

Material Safety Data Sheets, Carver Hall RM 208-A

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
Tin(II) chloride	2 mg/m ³ TWA (as Sn, except Tin hydride) (listed under Tin inorganic compounds).	2 mg/m ³ TWA (as Sn, except Tin oxide) (listed under Tin inorganic compounds).	2 mg/m ³ TWA (as Sn, except oxides) (listed under Tin inorganic compounds).

OSHA Vacated PELs: Tin(II) chloride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: white

Odor: weak odor

pH: 2 (10% aq.sol.)

Vapor Pressure: Negligible.

Vapor Density: Not applicable.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 652 deg C @ 760 mmHg

Freezing/Melting Point: 246 deg C

Decomposition Temperature: Not available.

Solubility: Soluble.

Specific Gravity/Density: 3.950

Material Safety Data Sheets, Carver Hall RM 208-A

Molecular Formula: Cl₂Sn

Molecular Weight: 189.60

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, heating to decomposition, exposure to moist air or water.

Incompatibilities with Other Materials: Metals, strong oxidizing agents, strong bases, bromine trifluoride, ethylene oxide, nitrates, potassium, hydrogen peroxide, sodium, azo, diazo, and hydrazines (e.g. dimethyl hydrazine, hydrazine, methyl hydrazine), water reactive substances (e.g. acetic anhydride, alkyl aluminum chloride, calcium carbide, ethyl dichlorosilane), metal nitrates.

Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide, tin/tin oxides.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7772-99-8: XP8700000

LD50/LC50:

CAS# 7772-99-8:

Oral, mouse: LD50 = 250 mg/kg;

Oral, rabbit: LD50 = 10 gm/kg;

Oral, rat: LD50 = 700 mg/kg;

Carcinogenicity:

CAS# 7772-99-8: 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: Water flea Daphnia: EC50 = 19.5 mg/L; 48 Hr; Unspecified Fish: Pseudomonas putida: ; ; No data available.

Environmental: No information available.

Material Safety Data Sheets, Carver Hall RM 208-A

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O. (Tin (II) chloride)	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O. (Tin (II))
Hazard Class:	8	8
UN Number:	UN3260	UN3260
Packing Group:	III	III
Additional Info:		chloride)

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7772-99-8 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.

Material Safety Data Sheets, Carver Hall RM 208-A

SARA Codes

CAS # 7772-99-8: immediate, delayed, fire.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7772-99-8 can be found on the following state right to know lists: New Jersey, Minnesota, (listed as Tin inorganic compounds), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 22 Harmful if swallowed.

R 34 Causes burns.

R 43 May cause sensitization by skin contact.

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# 7772-99-8: 1

Canada - DSL/NDSL

CAS# 7772-99-8 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# 7772-99-8 is listed on the Canadian Ingredient Disclosure List.

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Sulfur

- Brimstone
- Flowers of sulfur

Formula S

Structure



Description Yellow powder. Exists in several forms such as s2, s8 and polymeric.

Uses In manufacturing sulfuric acid, carbon disulfide, sulfites, insecticides, plastics, enamels, metal-glass cements, in vulcanizing rubber, in syntheses of dyes, in making gunpowder, matches, for bleaching wood pulp, straw, wool, silk, felt, linen.

Registry Numbers and Inventories.

CAS	7704-34-9
NIH PubChem CID	5362487
EC (EINECS/ELINCS)	231-722-6
EC Class	R: 11-36, S: 16-26-36
RTECS	WS4250000
RTECS class	Agricultural Chemical and Pesticide; Primary Irritant
UN (DOT)	1350
Merck	12,9142
Beilstein/Gmelin	16299 (G)
EPA OPP	77501

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Swiss Giftliste 1	G-54929
Canada DSL/NDSL	DSL
US TSCA	Listed
Australia AICS	Listed
New Zealand	Listed
Philippiens PICCS	Listed
Israel	Listed

Properties.

Formula	S
Formula mass	32.06
Melting point, °C	113 - 119
Boiling point, °C	445
Vapor pressure, mm _{Hg}	0.075 (20 C)
Vapor density (air=1)	3.64
Critical temperature	1040
Density	2.36 g/cm ³
Solubility in water	Insoluble
Viscosity	11.130 cp at 120 C
Surface tension	60.8 g/s ²
Refractive index	2.068

Material Safety Data Sheets, Carver Hall RM 208-A

Dipole moment	0 D
Dielectric constant	3.48 (150 C)
Thermal expansion	0.00046/K (20 C)
Heat of fusion	1.2 kJ/mol
Heat of vaporization	8.9 kJ/mol
Heat of combustion	-353 kJ/mol

Hazards and Protection.

Storage

Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

WHMIS

B4

Handling

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. May form flammable dust-air mixtures. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Use with adequate ventilation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Protection

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin: Wear appropriate protective gloves to prevent skin exposure. Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators

When Hydrogen Sulfide (H₂S) concentrations are unknown or are equal to or greater than 10 ppm, (as in such activities as: loading; unloading; guaging; cleaning large spills or upon entry into tanks, vessels, or other confined spaces; and during rescue of individuals suspected to be overexposed to H₂S), use supplied-air (airline or self-contained breathing apparatus) respiratory protection (NIOSH/MSHA Approved). The respirators must be equipped with pressure-demand regulators and operated in the pressure demand mode ONLY. If airline units are used, a 5-minute egress bottle MUST also be carried. GAS MASKS OR OTHER AIR-PURIFYING RESPIRATORS MUST NEVER BE USED FOR H₂S DUE TO POOR WARNING PROPERTIES OF THE GAS.

Small spills/leaks

Vacuum or sweep up material and place into a suitable disposal container. Clean up spills

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immediately, using the appropriate protective equipment. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition. Provide ventilation.

Stability Stable at room temperature in closed containers under normal storage and handling conditions.

Incompatibilities Alkalis and oxidizing agents such as chlorine and fluorine. May react explosively with ammonia, ammonium nitrate, chlorine dioxide (bromates, chlorates, and iodates of barium, calcium, magnesium, potassium, sodium or zinc), chlorate in presence of copper), chromic anhydride, silver bromate, lead dioxide, mercuric nitrate, all inorganic perchlorates, phosphorus trioxide, sodium nitrate, and zinc.

Decomposition Sulfur oxides (SO_x), including sulfur oxide and sulfur dioxide.

Fire.

Flash Point, °C 160

Autoignition, °C 235

Upper exp. limit, % 46

Lower exp. limit, % 3.3

Fire fighting Wear full protective clothing and positive pressure breathing apparatus. Use fine spray or fog to control fire by preventing its spread and absorbing some of its heat. Use water spray to cool fire-exposed surfaces, protect personnel, and knock down toxic fumes. Water or foam may cause frothing of molten sulfur. Extinguish fire using agent suitable for surrounding fire. (Fire in liquid sulfur can be extinguished readily by closing container to exclude oxygen).

Fire potential Flammable/combustible material.

Hazards May be ignited by friction, heat, sparks or flames. Some may burn rapidly with flare burning effect. Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence. Substance may be transported in a molten form. May re-ignite after fire is extinguished.

Combustion products Produces toxic sulfur dioxide gas.

NFPA **Health** 1

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Flammability 1

Reactivity 0

Health.

Exposure limit(s) ACGIH TLV: 10 mg/m³; OSHA PEL 15 mg/m³

Poison_Class 5

Exposure effects Repeated inhalation may cause lung damage.

Ingestion May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation Vapors are irritating to the nose, throat and respiratory tract, and may cause chronic bronchitis with chronic exposure. Hydrogen sulfide may not be sensed by smell at concentrations of 150 ppm or greater. Hydrogen sulfide is life threatening above 200 ppm. Inhalation at 200 - 250 ppm produces headache, dizziness, excitement, staggering and vomiting. Prolonged exposure to hydrogen sulfide in this concentration range may cause lung damage and exposure for 4 to 8 hours can cause death. Concentrations of 300-500 ppm (of hydrogen sulfide) cause these same effects sooner and more severely. Death can occur in 1 to 4 hours. At 500 ppm respiratory failure can occur in 5 minutes to 1 hour. Exposures above 500 ppm rapidly cause unconsciousness and death.

Skin May cause irritation with discomfort, and seen as local redness and possible swelling. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort. Skin contact with hot or molten product can cause skin burns.

Eyes May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye. Eye contact with hot or molten product can cause eye burns.

First aid

Ingestion DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give 1/2 to 1 glass of water to dilute material. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomit, rinse mouth and administer more water. IMMEDIATELY contact local poison control center. Vomiting may need to be induced but should be directed by a physician or a poison control center. IMMEDIATELY transport victim to an emergency facility.

Inhalation Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If

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breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Skin Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Eyes Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Transportation.

UN number 1350

Response guide [133](#)

Hazard class 4.1



Packing Group III

USCG CHRIS Code SXY

[USCG Compatatibility Group](#) 0 Unassigned

HS Code 2802 00 00

Std. Transport # 4917403

IMO Pollution Category III

IMO Hazard code S

Material Safety Data Sheet

Tin Metal, granular and mossy

ACC# 23480

Section 1 - Chemical Product and Company Identification

MSDS Name: Tin Metal, granular and mossy

Catalog Numbers: S71214-1, T123-500, T127-500, T128-500, T131-1LB

Synonyms: Metallic Tin; Elemental Tin; Stannum; C.I. 77860.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-31-5	Tin	100	231-141-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver white solid.

Caution! May cause respiratory and digestive tract irritation. May cause mechanical eye and skin irritation. Inhalation of fumes may cause metal-fume fever. May cause central nervous system effects.

Target Organs: Central nervous system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: Prolonged and/or repeated contact may cause irritation and/or dermatitis.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Ingested inorganic tin exhibits only moderate toxicity due to poor absorption and rapid tissue turnover. Ingestion of large amounts may cause gastrointestinal irritation, nausea, cramps, vomiting and diarrhea. May interfere with various enzyme systems. Inorganic tin salts may cause systemic effects on the central nervous system, heart and liver.

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Inhalation: Dust is irritating to the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. When inhaled as a dust or fume, may cause benign pneumoconiosis.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic exposure to tin oxide dusts and fumes may result in stannosis (benign pneumoconiosis).

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. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. 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. Use extinguishing media appropriate to the surrounding fire. Substance is noncombustible.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not available.

Autoignition Temperature: 430 deg C (806.00 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: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tin	2 mg/m ³ TWA	2 mg/m ³ TWA 100 mg/m ³ IDLH	none listed

OSHA Vacated PELs: Tin: 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: 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: silver white

Odor: none reported

pH: Not applicable.

Vapor Pressure: 1 mm Hg @ 1492 deg

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not applicable.

Boiling Point: 2507 deg C

Freezing/Melting Point:231.9 deg C

Material Safety Data Sheets, Carver Hall RM 208-A

Decomposition Temperature: Not applicable.

Solubility: Slightly soluble in hot water.

Specific Gravity/Density: 7.31

Molecular Formula: Sn

Molecular Weight: 118.69

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: Halogens, nitric acid, sodium peroxide, sulfur, copper nitrate, hydrochloric acid, tin chloride, potassium peroxide.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, tin/tin oxides.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-31-5: XP7320000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7440-31-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Tumors were observed at the site of application when implanted into in rats (TDLo=395 mg/kg) and mice (TDLo=840 gm/kg), according to RTECS.

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

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waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure 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# 7440-31-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone 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

Material Safety Data Sheets, Carver Hall RM 208-A

CAS# 7440-31-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7440-31-5: No information available.

Canada - DSL/NDSL

CAS# 7440-31-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7440-31-5 is listed on the Canadian Ingredient Disclosure List

Material Safety Data Sheet

Tin, Powder, 99.9999%

ACC# 97255

Section 1 - Chemical Product and Company Identification

MSDS Name: Tin, Powder, 99.9999%

Catalog Numbers: AC194310000, AC194310050, AC325840000, AC325840010, AC325840050, T129-500

Synonyms: Metallic Tin; Silver Matt Powder; Tin Flake; Tin Powder; Wang; Elemental Tin; Stannum; C.I. 77860; C.I. Pigment Metal 5

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-31-5	TIN	99.9999%	231-141-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: silver white solid.

Caution! May cause respiratory and digestive tract irritation. May cause mechanical eye and skin irritation. Inhalation of fumes may cause metal-fume fever. May cause central nervous system effects. This is expected to be a low hazard for usual industrial handling.

Target Organs: Central nervous system.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis. Low hazard for usual industrial handling.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Low hazard for usual

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industrial handling. Ingested inorganic tin exhibits only moderate toxicity due to poor absorption and rapid tissue turnover. Ingestion of large amounts may cause gastrointestinal irritation, nausea, cramps, vomiting and diarrhea. May interfere with various enzyme systems. Inorganic tin salts may cause systemic effects on the central nervous system, heart and liver. It may also interfere with absorption and metabolism of biological essential enzyme systems.

Inhalation: Dust is irritating to the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. When inhaled as a dust or fume, may cause benign pneumoconiosis.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic exposure to tin oxide dusts and fumes may result in stannosis (benign pneumoconiosis).

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. Wash clothing before reuse. Flush skin with plenty of soap and water.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Do NOT use carbon dioxide. If water is the only media available, use in flooding amounts. Use dry sand, dry chemical, soda ash or lime.

Flash Point: Not available.

Autoignition Temperature: 430 deg C (806.00 deg F)

Explosion Limits, Lower:Not available.

Upper: 0.19

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.

Material Safety Data Sheets, Carver Hall RM 208-A

Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
TIN	2 mg/m ³ TWA	2 mg/m ³ TWA 100 mg/m ³ IDLH	none listed

OSHA Vacated PELs: TIN: 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: 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: silver white

Odor: none reported

pH: Not applicable.

Vapor Pressure: 1 mm Hg @ 1492 deg

Vapor Density: Not available.

Evaporation Rate: Not applicable.

Material Safety Data Sheets, Carver Hall RM 208-A

Viscosity: Not applicable.

Boiling Point: 2507 deg C

Freezing/Melting Point: 231.9 deg C

Decomposition Temperature: Not applicable.

Solubility: Slightly soluble in hot water.

Specific Gravity/Density: 7.31

Molecular Formula: Sn

Molecular Weight: 118.69

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Oxidizes when exposed to air.

Conditions to Avoid: Incompatible materials, dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Halogens, nitric acid, sodium peroxide, sulfur, copper nitrate, hydrochloric acid, tin chloride, potassium peroxide.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, tin/tin oxides.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-31-5: XP7320000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7440-31-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Tumors were observed at the site of application when implanted into in rats (TDLo=395 mg/kg) and mice (TDLo=840 gm/kg), according to RTECS.

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

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-31-5 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.

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OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-31-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7440-31-5: No information available.

Canada - DSL/NDSL

CAS# 7440-31-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 7440-31-5 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Tungsten, Powder, 12 Micron, 99.9%

ACC# 99069

Section 1 - Chemical Product and Company Identification

MSDS Name: Tungsten, Powder, 12 Micron, 99.9%

Catalog Numbers: AC317840000, AC317841000

Synonyms: Tungsten

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7440-33-7	Tungsten	99.9	231-143-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to gray white solid.

Danger! Flammable solid. Pyrophoric. Spontaneously flammable in air. May be pyrophoric and become spontaneously flammable in air. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause eye and skin irritation. May cause adverse reproductive effects based upon animal studies.

Target Organs: None known.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic: Adverse reproductive effects have been reported in animals.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: 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: Evacuate area and fight fire from a safe distance. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. May burn with invisible flame. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable solid. Spontaneously ignitable in air.

Extinguishing Media: Use dry sand or earth to smother fire. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Use dry chemical to fight fire. Contact professional fire-fighters immediately.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 2; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Isolate area and deny entry. Provide ventilation. Place under an inert atmosphere. Do not use combustible materials such as paper towels to clean up spill. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

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Handling: Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Handle under an inert atmosphere. Do not 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. Do not expose to air. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tungsten	5 mg/m ³ TWA; 10 mg/m ³ STEL	5 mg/m ³ TWA	none listed

OSHA Vacated PELs: Tungsten: 5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: 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: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 5900 deg C

Material Safety Data Sheets, Carver Hall RM 208-A

Freezing/Melting Point:3410 deg C
Decomposition Temperature:Not available.
Solubility: Insoluble in water.
Specific Gravity/Density:Not available.
Molecular Formula:W
Molecular Weight:183.85

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Powder or liquid is pyrophoric.
Conditions to Avoid: Incompatible materials, ignition sources, dust generation, exposure to air, excess heat, strong oxidants, electrical sparks.
Incompatibilities with Other Materials: Bromine trifluoride, chlorine trifluoride, fluorine, iodine.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 7440-33-7: YO7175000
LD50/LC50:
CAS# 7440-33-7:
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 500 mg/24H Mild;

Carcinogenicity:
CAS# 7440-33-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.
Mutagenicity: No information found
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7440-33-7 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.

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OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-33-7 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:

Not available.

Risk Phrases:

R 10 Flammable.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 33 Take precautionary measures against static discharges.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 9 Keep container in a well-ventilated place.

S 28A After contact with skin, wash immediately with plenty of water

WGK (Water Danger/Protection)

CAS# 7440-33-7: No information available.

Canada - DSL/NDSL

CAS# 7440-33-7 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B4, 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# 7440-33-7 is listed on the Canadian Ingredient Disclosure List.

FISHER SCIENTIFIC -- URANYL ACETATE, DIHYDRATE, U-4 -- 6810-00-227-0404

===== Product Identification =====

Product ID:URANYL ACETATE, DIHYDRATE, U-4

MSDS Date:06/04/1992

FSC:6810

NIIN:00-227-0404

MSDS Number: CDWZR

=== 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:800-424-9300 (CHEMTREC)

CAGE:1B464

=== Contractor Identification ===

Material Safety Data Sheets, Carver Hall RM 208-A

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:URANIUM, BIS (ACETATO)DIOXO-, DIHYDRATE; (URANYL ACETATE,
DIHYDRATE)

CAS:6159-44-0
RTECS #:YR3600000
Fraction by Wt: 100%
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:EFTS OF OVEREXP: VASCULAR COLLAPSE & DEATH. SKIN: MAY BE
ABSORBED-KIDNEY DMG MAY ENSUE. DUST MAY IRRITATE. ALPHA (ING 3)
RTECS #:9999999ZZ

Ingred Name:ING 2: RADIA: ABSORPTION/PENETRATION THRU DAMAGED SKIN MAY
RSLT IN RADIA SICKNESS. EYE:DUSTS MAY IRRITATE. ALPHA (ING 4)
RTECS #:9999999ZZ

Ingred Name:ING 3: RADIA HAS BEEN SHOWN TO BE DAMAGING. RADIA AFFECTS
EYE BY INDUCING ACUTE INFLAMM OF CONJUNCTIVA & CORNEA. (ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4: INGEST: KIDNEY IS ORGAN MOST DIRECTLY AFFECTED. EFTS
PRECEDE IN TIME & DEGREE EFTS ON LIVER, WHICH ARE (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5: A CONSEQUENT TO ACIDOSIS INDUCED BY RENAL DYSFUNC.
CHRONIC:INHAL: LONG TERM EXPOS HAS BEEN RPTD TO CAUSE (ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6: INCR IN CANCER OF LYMPHATIC & BLOOD FORMING TISS OF
MAN. EFTS OF CHRONIC EXPOS BY INTERNALLY DEPOSITED (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7: ALPHA RADIA IS DEPENDENT UPON DOSE & TARGET ORGANS.
POSS DISORDERS INCL LUNG CANCER, STERILITY, ANEMIA, (ING 9)
RTECS #:9999999ZZ

Ingred Name:ING 8: LEUKEMIA/BONE CANCER. DELAYED EFTS OF RADIA MAY BE
DUE EITHER TO SINGLE LGE OVEREXP/CONTINUING LOW-LEVEL (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9: OVEREXP & MAY INCL CANCER, GENETIC EFTS, SHORTENING
OF LIFE SPAN & CATARACTS. IF GERM CELLS HAVE BEEN (ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10: AFFECTED, EFTS OF MUTATION MAY NOT BECOME APPARENT
UNTIL NEXT GENERATION/EVEN LATER. WARNING! ANY PERS (ING 12)
RTECS #:9999999ZZ

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Ingred Name:ING 11: INVOLVED IN RENDERING FIRST AID MUST BE MONITORED FOR RADIOACTIVITY & THORO DECONTAM IF NEC. SKIN:RPTD (ING 13)
RTECS #:9999999ZZ

Ingred Name:ING 12: EXPOS MAY CAUSE RADIA DMG & SICKNESS. EYE:CHRONIC CONT MAY IRRIT, PRDCE CONJ/CAUSE RADIA DMG, & MAY RSLT(ING 14)
RTECS #:9999999ZZ

Ingred Name:ING 13: IN CATARACT FORM. 100 RADS MAY CAUSE CONJ & KERATITIS. INGEST: RPTD EXPOS MAY RSLT IN KIDNEY FAILURE; (ING 15)
RTECS #:9999999ZZ

Ingred Name:ING 14: RADIA DMG TO BONE MARROW/KIDNEY. RPTD INGEST OF ALPHA EMITTERS MAY LEAD TO RADIA SICKNESS AS DESCRIBED (ING 16)
RTECS #:9999999ZZ

Ingred Name:ING 15: IN INHAL EXPOS. CONTACT NEHC FOR MORE SPECIFIC INFORMATION ON HEALTH HAZARDS .
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC: W/SOAP & WATER, PAYING PARTICULAR ATTN TO HEAD, FINGER NAILS & PALMS OF HANDS. MONITOR VICTIM (ING 18)
RTECS #:9999999ZZ

Ingred Name:ING 17: FOR RADIOACTIVITY. SKIN SHOULD BE DECONTAM AS QUICKLY AS POSS. IF WATER & SOAP HAVE BEEN INADEQ IN (ING 19)
RTECS #:9999999ZZ

Ingred Name:ING 18: REMOVING CMPD, DECONTAM CMPDS CONSISTING OF SURFACTANTS & ABSORB SUBSTANCES MAY BE EFTIVE. CONTAM CLTHG (ING 20)
RTECS #:9999999ZZ

Ingred Name:ING 19: MUST BE STORED IN METAL CNTNR FOR LATER DECONTAM/DISP. WATER USED TO WASH VICTIM MUST BE STORED IN METAL(ING 21)
RTECS #:9999999ZZ

Ingred Name:ING 20: CNTNRS FOR LATER DISP. EYE:REMOVE TO RESTRICTED AREA FOR DECONTAM. THORO WASH W/LG AMTS OF WATER, OCCAS (ING 22)
RTECS #:9999999ZZ

Ingred Name:ING 21: LIFTING UPPER & LOWER LIDS (APPROX 15 MINS). FOLLOWING WATER TREATMENT, PROVIDE ISOTONIC SOLN. DO NOT (ING 23)
RTECS #:9999999ZZ

Ingred Name:ING 22: USE EYEBATHS, RATHER PROVIDE CONTINUOUS & COPIOUS SUPPLY OF FLUID. MONITOR FOR RADIOACTIVITY. WATER USED(ING 24)
RTECS #:9999999ZZ

Ingred Name:ING 23: MUST BE STORED IN METAL CNTNR FOR LATER DISP. INGEST:RINSE MOUTH IMMED, TAKING CARE NOT TO SWALLOW RINSE(ING 25)
RTECS #:9999999ZZ

Ingred Name:ING 24: WATER. INDUCE VOMIT UNLESS VICTIM UNCON. AVOID ASPIR. NO ANTIDOTE. TREAT SYMPTOMATICALLY & SUPPORTIVELY.
RTECS #:9999999ZZ

Material Safety Data Sheets, Carver Hall RM 208-A

===== 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: INHAL: 20 MG/M3 IDLH. DUST MAY IRRITATE RESP SYS. MAY RSLT IN ABSORPTION & SUBSEQUENT RENAL FAILURE. PRIMARY RSLTS OF POIS ARE ALBUMINURIA, HEMATURIA, OLIGURIA, & POSS ANURIA. SUBSEQUENT LIVER DMG MAY BE CONSEQUENT TO ACIDOSIS INDUCED BY RENAL DYSFUNC. URANIUM IS STORED IN KIDNEYS & BONES. (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT.
Effects of Overexposure:HLTH HAZ: ALPHA RADIA MAY AFFECT TISS & WILL KILL CELLS IMMED ADJACENT TO CONT SOURCE. DMGD CELLS MAY NOT RECOVER/BE REPAIRED. SINGLE LGE DOSE OF RADIA MAY LEAD TO RADIA SICKNESS. 200-1000 RADS MAY CAUSE ANOREXIA, APATHY, NAUS & VOMIT. 400/MORE RADS MAY CAUSE NAUS, VOMIT & DIARR THAT MAY LEAD TO SEV DEHYDRATION, (ING 5)
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

===== First Aid Measures =====

First Aid:INHAL: REMOVE TO RESTRICTED AREA W/FRESH AIR AS QUICKLY AS POSS. IF BRTHG STOPPED, GIVE ARTF RESP BY ADMIN OXYGEN; MOUTH-TO-MOUTH RESUSCITATION SHOULD BE AVOIDED TO PVNT EXPOS. IF TIME PERMITS, WIPE F ACE W/WET FILTER PAPER, FORCE COUGHING & BLOWING OF NOSE. GET MED ATTN IMMED. SKIN: REMOVE TO SUITABLE AREA FOR DECONTAM AS QUICKLY AS POSS. REMOVE CLTHG & SHOES IMMED. THORO WASH VICTIM (ING 17)

===== Fire Fighting Measures =====

Extinguishing Media:DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR REGULAR FOAM. FOR LARGER FIRES, USE WATER SPRAY OR FOG (FLOODING AMOUNTS).
Fire Fighting Procedures:WEAR NIOSH APPRVD SCBA & FULL PROT EQUIP . DO NOT MOVE DAMAGED CONTRS; MOVE UNDAMAGED CONTRS OUT OF FIRE ZONE. FOR MASSIVE FIRE IN CARGO AREA, (SUP DAT)
Unusual Fire/Explosion Hazard:NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT/FLAME. MAY BURN, BUT DOES NOT IGNITE READILY. WHEN HEATED TO DECOMPOSITION, MAY EMIT IRRITATING/POISONOUS GASES.

===== Accidental Release Measures =====

Spill Release Procedures:DO NOT TOUCH DMGD CONTRS/SPILLED MATL. DMG TO OUTER CONTR MAY NOT AFFECT PRIMARY INNER CONTR. SM LIQ SPILL: TAKE UP W/ASORB MATL. LG SPILL: DIKE FAR AHEAD FOR LATER DISP. ISOLATE HAZ AREA & DENY ENTRY . FOR MORE SPECIFIC INFO CONT NEHC .
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:MAY BURN BUT DOES NOT IGNITE READILY.
Other Precautions:NONE SPECIFIED BY MANUFACTURER.

===== Exposure Controls/Personal Protection =====

Material Safety Data Sheets, Carver Hall RM 208-A

Respiratory Protection:RESP SELECTED MUST BE NIOSH APPRVD. 0.5 MG/M3:
ANY AIR-PURIFYING RESP W/HIGH-EFFICIENCY PARTICULATE FILTER; ANY
SUPP-AIR RESP; ANY SCBA. 1.25 MG/M3: ANY SUPP-AIR RESP OPERATED IN
CONTINUOUS FLOW MODE. CONT NEHC FOR COMPLETE LIST .

Ventilation:AT MIN, LOC EXHST/PROCESS ENCLOSURE VENT, DEPENDING UPON
SPECIFIC WORKPLACE ACTIVITY & RADIOACTIVITY OF (SUP DAT)

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPRVD CHEM WORKERS GOGGLES .

Other Protective Equipment:ANSI APPRVD EMER EYEWASH & DELUGE SHOWER .
DISP OVERGARMENTS, INCL HEAD COVERINGS & FOOT COVERING.

Work Hygienic Practices:CONTACT LENSES SHOULD NOT BE WORN.

Supplemental Safety and Health

FIRE FIGHT PROC: USE UNMANNED HOSE HOLDER/MONITOR NOZZ. CONT LOC,
STATE/DEPARTMENT OF ENERGY RADIOLOGICAL RESPONSE TEAM. COOL CONTRS
W/FLOODING AMTS OF WATER FROM AS FAR DIST AS POSS. KEEP UPWIND. CON
T NEHC FOR MORE SPECIFIC INFO . VENT: ISOTOPE, MORE STRINGENT VENT
SYS MAY BE NEC.

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:527F,275C

Melt/Freeze Pt:M.P/F.P Text:230F,110C

Spec Gravity:2.89

Solubility in Water:7.7% SOLUBLE

Appearance and Odor:YELLOW RHOMBIC CRYSTALS WITH SLIGHT VINEGAR ODOR

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

NONE KNOWN.

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:THERMAL DECOMPOSITION PRODUCTS MAY
INCLUDE TOXIC OXIDES OF CARBON.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSAL MUST BE IN ACCORDANCE WITH 10 CFR 20
AND 60. OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN
DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT
DIRECTOR OF THE ENVIRONMEN TAL PROTECTION AGENCY.

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particular situation.

Material Safety Data Sheets, Carver Hall RM 208-A

FISHER SCIENTIFIC, CHEMICAL DIV. -- URANYL NITRATE,HEXAHYDRATE, U725 -- 6810-00N008681

=====
Product Identification
=====

Product ID:URANYL NITRATE,HEXAHYDRATE, U725
MSDS Date:04/27/1986
FSC:6810
NIIN:00N008681
MSDS Number: BCQTT
=== Responsible Party ===
Company Name:FISHER SCIENTIFIC, CHEMICAL DIV.
Address:1 REAGENT LANE
City:FAIRLAWN
State:NJ
ZIP:07410-2802
Info Phone Num:201-796-7100
Emergency Phone Num:201-796-7100 (GASTON L. PILLORI
CAGE:IB464

=====
Contractor Identification
=====

Company Name:FISHER SCIENTIFIC CO
Address:1 REAGENT LANE
Box:City:FAIRLAWN
State:NJ
ZIP:07410
Country:US
Phone:201-796-7100
CAGE:IB464

=====
Composition/Information on Ingredients
=====

Ingred Name:URANYL NITRATE,HEXAHYDRATE
CAS:113520-83-7
RTECS #:YR3850000
Fraction by Wt: 100%
Other REC Limits:N/K
OSHA PEL:0.05 MG(U)/CUM TWA
ACGIH TLV:0.2 MG(U)/CUM TWA

=====
Hazards Identification
=====

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYE & MUCOUS MEMBRANE
IRRITANT.POISONING MAY DMG
EYES,LUNGS,KIDNEYS,SKIN,LIVER,LYMPHATICS,BLOOD & BONE
MARROW.URANIUM MAY CAUSE RADIATION DMG,CARCINOGENESIS.LONG TERM
EXPOSURE TO SOLUBLE URANIUM SALTS HAS BEEN REPORTED TO CAUSE AN
INCREASEIN CANCER OF LYMPHATIC & BLOOD-FORMING TISSUE OF MAN.
Explanation of Carcinogenicity:LONG TERM EXPOS TO SOLUBLE URANIUM SALTS
REPORTED TO CAUSE INCREASE CANCER OF LYMPHATIC & BLOOD FORMING
TISSUE OF MAN.
Effects of Overexposure:INH:ACUTE EXPOS-IRRIT LUNGS,KIDNEYS INFLAMN W/
URINATION DISORDERS.SUBSEQUENT LIQUER DMG.POSS NITRATE POISONING
CAUSES CYANOSIS,METHEMOGLOBINEMIA,HYPOTENSION,TACHY,NERVOUS SYMP &
POSS CONVUL & COMA.CH RONIC EXPOS-PULMONRY & RENAL
DMG.SKIN:ACUTE-IRRIT.CHRONIC-DERMATITIS.EYE:ACUTE-MOD TO SEV INJURY
(SUPP DATA)
Medical Cond Aggravated by Exposure:N/K

Material Safety Data Sheets, Carver Hall RM 208-A

===== First Aid Measures =====

First Aid:INH:REMOVE TO FRESH AIR.W/ STOPPED BRTHING,GIVE O*2.KEEP WARM & REST.SKIN:REMOVE CONTAMED CLOTHING & SHOES.WASH AFFECTED AREA W/ SOAP/MILD DETERGENT & H*2O FOR APPROX 15-20 MINUTES.EYE:WASH W/ H*2O FO R AT LEAST 15 MINUTES.INGEST:IF CONSCIOUS,GIVE 2-4 GLASSES OF H*2O & INDUCE VOMIT.IN ALL ABOVE CASES,GET IMMED MED ATTN & ADVISE MED PERSON THAT VICTIM MAY BE CONTAMED W/ RADIOACTIVE MATL/CHEM BURN.

===== Fire Fighting Measures =====

Flash Point:NONCOMBUSTIBLE
Lower Limits:N/K
Upper Limits:N/K
Extinguishing Media:DRY CHEMICAL,CO*2,H*2O SPRAY OR FOAM.W/LG FIRE,USE FLOODING AMT OF H*2O FROM A DISTANCE
Fire Fighting Procedures:PRESS-DEMAND/OTHR POSITIVE PRESS SCBA W/FULL FACEPIECE.CALL LOCAL/STATE/DOE RADIOL RESPONSE TEAM.AVOID BRTNING DUST/VAPORS.EVACUATE 2500FT RADIUS (SUPP DATA)
Unusual Fire/Explosion Hazard:SMALL FIRE & SEV EXPLOSION HAZARD WHEN SFOCHED/FRICTION/HEAT OR CONT W/ OXIDIZABLE MATL.H*2O MAY CAUSE SCATTERING OF MOLTEN MATL.RELEASES (SEE OTHER PRECAUT)

===== Accidental Release Measures =====

Spill Release Procedures:SOIL:DIG HOLDING AREA.DIKE FLOW OF SPILL W/ SOIL/FOAM/CONCRETE.ABSORB SPILL W/ CEMENT POWDER/FLY ASH.NEUTRALIZE SPILL W/AGENTS.H*2O:NEUTRALIZE TO PH7.EXTRACT PRECIPT.OCCU:USE ABSORBENT MATL FOR SM SPI LL.FOR LG SPILL,DIKE AHEAD OF SPILL (SUPP DATA)
Neutralizing Agent:AGRICULTURAL/SLAKED LIME,CRUSHED LIMETONE,SODIUM BICARBONATE

===== Handling and Storage =====

Handling and Storage Precautions:PROTECT CONTR FROM PHYSICAL DMG & AVOID CONTACT W/ INCOMPATIBLES .
Other Precautions:UNUSUAL FIRE HAZ:TOXIC GASEOUS NITROGEN OXIDED IF INVOLVED IN FIRE.INCREASES FLAMMABILITY OF ANY COMBUSTIBLE MATL.IF SHAKEN,RUBBED/CRUSHED,CRYSTALS SHOW TRIBOLUMINESCENCE WITH OCCASIONAL DETONATION.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:2.5 MG(U)/CUM:HIGH EFFECIENT PARTICULATE RSPTR W/FULL FACEPIECE,SUPPLY AIR RSPTR,SCBA.20 MG(U)/CUM:TYPE C SUPPLY AIR RSPTR W/FULL FACEPIECE IN PRESS DEMAND/OTHR POSITIVE PRESS MODE OR W/FULL FACEPIECE ,HELMET/HOOD W/CONSTANT FLOW.ESCAPE:SCBA
Ventilation:PROCESS ENCLOSURE RECOMMENCED (MFR) .
Protective Gloves:WEAR APPROPRIATE PROTECTIVE GLOVES
Eye Protection:CHEMICAL WORKERS GOGGLES & FACESHLD
Other Protective Equipment:WEAR APPROPRIATE PROTECTIVE CLTHG & EQUIPMENT TO PREVENT SKIN CONTACT WITH SUBSTANCE.
Work Hygienic Practices:PROVIDE EYE-WASH STATION WITHIN IMMEDIATE WORK AREA FOR EMERGENCY USE
Supplemental Safety and Health
SIGNS & SYMP:EYE:CHRONIC-CONJUNCTIVITIS.INGEST:ACUTE-MOUTH & STOMACH

Material Safety Data Sheets, Carver Hall RM 208-A

IRRIT, TOXIC AMT MAY CAUSE EARLY SYMP OF NITRATE POISONING & DELAYED SYMP OF URANIUM TOXICITY. FIRE FGTING: KEEP AREA CLEAR UNTIL DECLARED SAFE. SPILL PROC: DELAY CLEANUP OF LG OCC SPILL TILL ARRIVAL OF QUALIFIED AUTHORITY

===== Physical/Chemical Properties =====

Boiling Pt: B.P. Text: 244F, 118C
Melt/Freeze Pt: M.P/F.P Text: 140 60C
Decomp Temp: Decomp Text: N/K
Vapor Pres: N/K
Vapor Density: N/K
Spec Gravity: 2.8
pH: ACIDIC
Evaporation Rate & Reference: N/K
Solubility in Water: SOLUBLE
Appearance and Odor: ODORLESS, YELLOW, DELIQUESCENT, RHOMBIC CRYSTALS.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES
ORGANIC SOLVENTS & OTHER OXIDIZABLE MATL, COMBUSTIBLES. ABSORBED ON CELLULOSE TO FORM EXPLOSIVE CELLULOSE NITRATE
Stability Condition to Avoid: IN ETHER SOLN, MAY EXPLODE UNDER SUNLIGHT. H*2O SOLN IS ACIDIC, CORRODES METALS. MAY TRIBOLUMINESCE/EXPLODE FROM FRICTION.
Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY RELEASE TOXIC OXIDES OF NITROGEN.

===== Disposal Considerations =====

Waste Disposal Methods: DISPOSAL MUST BE IN ACCORDANCE W/ FEDERAL, STATE & LOCAL REGULATIONS .

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Material Safety Data Sheets, Carver Hall RM 208-A

UOP RESEARCH CENTER -- MOLECULAR SIEVE TYPE 4AXH5;ZEOLITE -- 6850-01-321-3333

=====
Product Identification
=====

Product ID:MOLECULAR SIEVE TYPE 4AXH5;ZEOLITE
MSDS Date:06/01/1990
FSC:6850
NIIN:01-321-3333
MSDS Number: BRSWN
=== Responsible Party ===
Company Name:UOP RESEARCH CENTER
Address:50 ALGONQUIN RD.
City:DES PLAINES
State:IL
ZIP:60017-5016
Country:US
Info Phone Num:708-391-2123
Emergency Phone Num:708-391-2123 800-424-9300 (CHEMTREC)
CAGE:0FHB1

==== Contractor Identification ====

Company Name:UOP LLC
Address:25 E ALGONQUIN RD
Box:City:DES PLAINES
State:IL
ZIP:60017-5017
Country:US
Phone:847-391-3189 FAX: 847-391-2953
CAGE:02QC3
Company Name:UOP RESEARCH CENTER
Address:50 ALGONQUIN RD.
Box:City:DES PLAINES
State:IL
ZIP:60017-5016
Country:US
Phone:708-391-2123
CAGE:0FHB1

=====
Composition/Information on Ingredients
=====

Ingred Name:SODIUM MONOXIDE
CAS:12401-86-4
RTECS #:WC4800000
Fraction by Wt: <30%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:15 MG/M3 TOTAL DUST
ACGIH TLV:10 MG/M3 TOTAL DUST

Ingred Name:ALPHA-ALUMINA (ALUMINUM OXIDE) (EPA LISTS ONLY FIBROUS
FORMS) (SARA III)
CAS:1344-28-1
RTECS #:BD1200000
Fraction by Wt: <30%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:15 MG/M3 TDUST
ACGIH TLV:10 MG/M3 TDUST; 9293

Ingred Name:SILICA, AMORPHOUS, PRECIPITATED AND GEL
CAS:112945-52-5
RTECS #:VV7310000

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Fraction by Wt: <50%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:6 MG/M3
ACGIH TLV:10 MG/M3; 9293

Ingred Name:SILICA, CRYSTALLINE - QUARTZ
CAS:14808-60-7
RTECS #:VV7330000
Fraction by Wt: <1%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:SEE TABLE Z3
ACGIH TLV:0.1 MG/M3 RDUST;9293

===== Hazards Identification =====

LD50 LC50 Mixture:TLV(TWA)=0.1MG.M3 RESPIRABLE DUST
Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:YES IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INGEST:PRODUCT GETS HOT AS IT ABSORBS
WATER.SKIN:IRRITANT.INHAL:IRRITANT.PROLONGED INHALATION MAY CAUSE
LUNG DAMAGE.EYES:IRRITANT.
Explanation of Carcinogenicity:CRYSTALLINE SILICA HAS BEEN CLASSIFIED
BY NTP AS A "REASONABLY ANTICIPATED CARCINOGEN".
Effects of Overexposure:INGEST:BURNS TO MOIST BODY
TISSUES.SKIN:REDNESS,BURNS.INHAL"NOSE AND THROAT
IRRITATION,COUGH,CHEST DISCOMFORT.EYES:IRRITATION AND REDNESS OF
THE CONJUCTIVA.
Medical Cond Aggravated by Exposure:PERSONS WITH PRE-EXISTING
RESPIRATORY AILMENTS MAY BE AT INCREASED RISK FROM EXPOSURE.

===== First Aid Measures =====

First Aid:INGEST:IF CONSCIOUS,GIVE 2 GLASSES OF WATER.DO NOT INDUCE
VOMITING UNLESS BY ADVISE OF PHYSICIAN.SKIN:WASH WITH SOAP AND
WATER.INHAL:REMOVE TO FRSH AIR.EYES:FLUSH WITH WATER FOR 15
MINUTES.PHYSICIAN-T REAT SYMPTOMATICALLY.PRODUCT GENERATES HEAT AS
IT ABSORBS WATER.

===== Fire Fighting Measures =====

Flash Point:NONE
Extinguishing Media:MATERIEL DOES NOT BURN.USE EXTINGUISHING MEDIA
APPROPRIATE FOR SURROUNDING FIRE.
Fire Fighting Procedures:HMIS SUGGESTS TO USE A SELF-CONTAINED
BREATHING APPARATUS AND FULL PROTECTIVE EQUIPMENT.
Unusual Fire/Explosion Hazard:MOLECULAR SIEVES,WHEN ADDED TO WATER,WILL
HEAT IT TO ITS BOILING OINT;FLOODING WILL REDUCE THE TEMPERATURE TO
SAFE LIMITS.

===== Accidental Release Measures =====

Spill Release Procedures:AVOID CREATING DUST.VACCUM WITH A HEPA VACUUM
OR WET SWEEP;PLACE IN AN APPROPRIATE CONTAINER FOR DISPOSAL.CLEAN
SPILL AREA BEFORE READMITTING PERSONNEL.
Neutralizing Agent:NONE

===== Handling and Storage =====

Material Safety Data Sheets, Carver Hall RM 208-A

Handling and Storage Precautions:REFER TO UOP'S
BOOKLET,M-1001,"PRECAUTIONS AND SAFE PRACTICES FOR HANDLING
MOLECULAR SIEVES IN PROCESS UNITS".

Other Precautions:ADDITION OF WATER TO MOLECULAR SIEVES GENERATES HIGH
HEAT.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE A NIOSH RESPIRATOR FOR DUST ABOVE TLV.

Ventilation:LOCAL EXHAUST IS RECOMMENDED.

Protective Gloves:IMPERMEABLE,AS NEEDED.

Eye Protection:SAFETY GLASSES;GOGGLES.

Other Protective Equipment:IAW OSHA 29CFR1910.132 AND .133

Work Hygienic Practices:WASH HANDS.SEPERATE WORK CLOTHES FROM STREET
CLOTHES.LAUNDER WORK CLOTHES BEFORE REUSE.KEEP FOOD OUT OF THE WORK
AREA.

Supplemental Safety and Health

PH IN A SLURRY IS 6 TO 9.

===== Physical/Chemical Properties =====

HCC:V7

Spec Gravity:1.1

Appearance and Odor:BEADS;TAN;ODORLESS.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

ADDITION OF WATER(WITHOUT FLOODING) AND OTHER MATERIELS WITH A HIGH
HEAT OF ABSORPTION(EG.OLEFINS,HCL) .

Stability Condition to Avoid:MOISTURE.

Hazardous Decomposition Products:OXIDES OF SILICON,ALUMINUM,SODIUM AND
HYDROCARBONS.

===== Disposal Considerations =====

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH 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

Zinc, Granular and Mossy

ACC# 88125

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc, Granular and Mossy

Catalog Numbers: AC201450000, AC201455000, AC222600000, AC222600030, AC222601000, AC222605000, AC222610000, AC222611000, AC222615000, Z11-500, Z15-3, Z15-3LC, Z15-500, Z16-500, Z2-3, Z2-500

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
7440-66-6	Zinc	100	231-175-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: bluish white, silvery gray solid.

Caution! Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

Target Organs: No data found.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation. 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. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain,

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muscle pain and increased white blood cell count. May be harmful if inhaled.

Chronic: Repeated inhalation may cause chronic bronchitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

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. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire.

Extinguishing Media: Do NOT use water directly on fire. Use dry chemical to fight fire. Use approved class D extinguishing agents or smother with dry sand, clay, or sodium bicarbonate.

Flash Point: Not available.

Autoignition Temperature: 460 deg C (860.00 deg F)

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

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Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. 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. Do not allow contact with water. Keep from contact with moist air and steam.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

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
Zinc	none listed	none listed	none listed

OSHA Vacated PELs: Zinc: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical 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: bluish white, silvery gray

Odor: odorless

pH: Not available.

Vapor Pressure: 1 mm Hg @ 487 deg C

Vapor Density: Not available.

Evaporation Rate: Not applicable

Viscosity: Not applicable

Boiling Point: 907 deg C

Freezing/Melting Point: 419 deg C

Decomposition Temperature: Not available.

Solubility: Reacts with water

Specific Gravity/Density: 7.14

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Molecular Formula:Zn
Molecular Weight:65.38

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, excess heat, strong oxidants, exposure to moist air or water.

Incompatibilities with Other Materials: Oxidizing agents, acids, bases.

Hazardous Decomposition Products: Toxic fumes of zinc oxide.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7440-66-6: ZG8600000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 7440-66-6: 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: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Physical: No information available.

Other: Do not empty into drains.

Section 13 - Disposal Considerations

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Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure 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# 7440-66-6 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

CAS# 7440-66-6: 1000 lb final RQ (no reporting of releases of this hazardous substance is required)

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-66-6: immediate.

Section 313

This material contains Zinc (CAS# 7440-66-6, 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.

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Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 7440-66-6 is listed as a Priority Pollutant under the Clean Water Act. CAS# 7440-66-6 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7440-66-6 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:

N

Risk Phrases:

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 60 This material and its container must be disposed of as hazardous waste.

WGK (Water Danger/Protection)

CAS# 7440-66-6: 0

Canada - DSL/NDSL

CAS# 7440-66-6 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

CAS# 7440-66-6 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Zinc carbonate

ACC# 25330

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc carbonate

Catalog Numbers: AC612365000, Z30-500

Synonyms: Zinc carbonate (1:1); Zinc Monocarbonate; Carbonic acid, zinc 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
3486-35-9	Zinc carbonate	90-100	222-477-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.

Caution! May cause eye, skin, and respiratory tract irritation. The toxicological properties of this material have not been fully investigated.

Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.

Skin: May cause skin irritation.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation: May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: 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 if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Material Safety Data Sheets, Carver Hall RM 208-A

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Zinc carbonate	none listed	none listed	none listed

OSHA Vacated PELs: Zinc carbonate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: odorless

pH: Not applicable.

Vapor Pressure: Not applicable.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Viscosity: Not applicable.

Boiling Point: Not applicable.

Freezing/Melting Point: Decomposes.

Decomposition Temperature: 300 deg C

Solubility: Insoluble in water.

Specific Gravity/Density: 4.398

Molecular Formula: ZnCO₃

Molecular Weight: 125.3782

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Decomposed by acids with effervescence, evolution of carbon dioxide.

Conditions to Avoid: Dust generation.

Incompatibilities with Other Materials: Strong acids.

Hazardous Decomposition Products: Carbon dioxide, zinc oxides.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 3486-35-9: FG3375000

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 3486-35-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: Zinc carbonate has caused skin abnormalities when administered orally to lactating female mice 14 days post birth at a dose of 2800 mg/kg.

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# 3486-35-9 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# 3486-35-9: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Zinc carbonate (listed as Zinc compounds), 90-100%, (CAS# 3486-35-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 3486-35-9 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 3486-35-9 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# 3486-35-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

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WGK (Water Danger/Protection)

CAS# 3486-35-9: 0

Canada - DSL/NDSL

CAS# 3486-35-9 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# 3486-35-9 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Zinc chloride

ACC# 25350

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc chloride

Catalog Numbers: AC196840000, AC196840010, AC196840050, AC198940000, AC198945000, AC318170000, AC318170100, AC380130000, AC380130050, AC380130250, AC424590000, AC424592500, AC424595000, NC9598753, S802471, Z31-3, Z32-12, Z32-212, Z32-50, Z32-500, Z33-100, Z33-3, Z33-500, Z34-12, Z34-212

Synonyms: Zinc butter; Zinc 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
7646-85-7	Zinc chloride	>97	231-592-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white to off-white crystalline powder.

Danger! Causes burns by all exposure routes. Harmful if swallowed. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Hygroscopic (absorbs moisture from the air). Corrosive to metal.

Target Organs: Respiratory system, gastrointestinal system, eyes, skin, mucous membranes.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns.

Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns.

Material Safety Data Sheets, Carver Hall RM 208-A

Inhalation: Causes chemical burns to the respiratory tract.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

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: 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. 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. 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 only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Zinc chloride	1 mg/m ³ TWA (fume); 2 mg/m ³ STEL (fume)	1 mg/m ³ TWA (fume) 50 mg/m ³ IDLH (fume)	1 mg/m ³ TWA (fume)

OSHA Vacated PELs: Zinc chloride: 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: Crystalline powder

Appearance: white to off-white

Odor: odorless

pH: 5 (100 g/L aq.sol.)

Vapor Pressure: 1.3 mbar @ 428 deg C

Vapor Density: Not available.

Evaporation Rate:Not applicable.

Viscosity: Not applicable.

Boiling Point: 732 deg C

Freezing/Melting Point:293 deg C

Decomposition Temperature:Not available.

Solubility: 432 g/100ml (25°C)

Specific Gravity/Density:2.91

Molecular Formula:ZnCl₂

Molecular Weight:136.29

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

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: Metals, strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7646-85-7: ZH1400000

LD50/LC50:

CAS# 7646-85-7:

Oral, mouse: LD50 = 329 mg/kg;

Oral, rat: LD50 = 350 mg/kg;

Carcinogenicity:

CAS# 7646-85-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Tumorigenic effects have been reported in experimental animals.

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.

Mutagenicity: Mutagenic effects have occurred in experimental animals. Mutagenic effects have occurred in humans. Mutation in microorganisms:

Neurotoxicity: Neurotoxic effects have occurred in experimental animals.

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:	ZINC CHLORIDE, ANHYDROUS	ZINC CHLORIDE, ANHYDROUS
Hazard Class:	8	8
UN Number:	UN2331	UN2331
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7646-85-7 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# 7646-85-7: 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 # 7646-85-7: immediate.

Section 313

This material contains Zinc chloride (listed as Zinc compounds), >97%, (CAS# 7646-85-7) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7646-85-7 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7646-85-7 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# 7646-85-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

Material Safety Data Sheets, Carver Hall RM 208-A

California Prop 65

California No 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 N

Risk Phrases:

R 22 Harmful if swallowed.

R 34 Causes burns.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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).

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# 7646-85-7: 1

Canada - DSL/NDSL

CAS# 7646-85-7 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# 7646-85-7 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet Zinc Iodide

ACC# 88286

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc Iodide

Catalog Numbers: A4929957

Synonyms: None.

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

Material Safety Data Sheets, Carver Hall RM 208-A

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
10139-47-6	Zinc Iodide	100	233-396-0

Hazard Symbols: C

Risk Phrases: 34

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: almost white crystalline powder. **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. May cause skin sensitization by skin contact. Hygroscopic (absorbs moisture from the air). Air sensitive. Light sensitive.

Target Organs: None.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. Chronic ingestion of iodides during pregnancy has resulted in fetal death, severe goiter, and cretinoid appearance of the newborn.

Inhalation: May cause allergic respiratory reaction. Causes chemical burns to the respiratory tract.

Chronic: 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: 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. Flush skin with plenty of water for at least 15 minutes while removing

Material Safety Data Sheets, Carver Hall RM 208-A

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. SPEED IS ESSENTIAL. A DOCTOR MUST BE NOTIFIED AT ONCE.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. 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. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use agent most appropriate to extinguish fire. Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 625 deg C (1,157.00 deg F)

Autoignition Temperature: Not available.

Explosion Limits, Lower:N/A

Upper: N/A

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: 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. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Use with adequate ventilation. Do not allow contact with water. Avoid contact with air and sunlight. Discard contaminated shoes.

Storage: Store in a cool, dry place. Keep container closed when not in use. Corrosives area. Store protected from light and air. Store under an inert atmosphere.

Section 8 - Exposure Controls, Personal Protection

Material Safety Data Sheets, Carver Hall RM 208-A

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
Zinc Iodide	none listed	none listed	none listed

OSHA Vacated PELs: Zinc Iodide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder

Appearance: almost white

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: 11.0

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 446 deg C

Decomposition Temperature: 625 deg C

Solubility: 4500 g/l (20 C)

Specific Gravity/Density: 4.7400

Molecular Formula: I₂Zn

Molecular Weight: 319.189

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, light, dust generation, moisture, exposure to air, excess heat, strong oxidants.

Incompatibilities with Other Materials: Strong oxidizing agents.

Material Safety Data Sheets, Carver Hall RM 208-A

Hazardous Decomposition Products: Hydrogen iodide, toxic fumes of zinc oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10139-47-6 unlisted.

LD50/LC50:

Not available.

Carcinogenicity:

CAS# 10139-47-6: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: Chronic exposure to iodides may cause fetal effects.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: No data available.

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				No information available.

Material Safety Data Sheets, Carver Hall RM 208-A

Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10139-47-6 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.

SARA

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPO.

Section 313

This material contains Zinc Iodide (listed as Zinc), 100%, (CAS# 10139-47-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10139-47-6 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:

C

Risk Phrases:

R 34 Causes burns.

Safety Phrases:

Material Safety Data Sheets, Carver Hall RM 208-A

S 28 After contact with skin, wash immediately with...

S 7/8 Keep container tightly closed and dry.

WGK (Water Danger/Protection)

CAS# 10139-47-6: No information available.

Canada - DSL/NDSL

CAS# 10139-47-6 is listed on Canada's NDSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

CAS# 10139-47-6 is not listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 10139-47-6 (listed as zinc): OEL-ARAB Republic of Egypt: TWA 0.1 mg/m³

Material Safety Data Sheet

Zinc oxide

ACC# 25490

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc oxide

Catalog Numbers: AC194890000, AC194890010, AC315790000, AC315790250, AC422740000, AC422740010, AC422740050, Z50-12, Z50-212, Z50-500, Z52-10, Z52-500

Synonyms: Zinc white; Chinese white; C.I. Pigment White 4; C.I. 77947.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1314-13-2	Zinc oxide	>99	215-222-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white or yellow-white solid.

Caution! May cause eye, skin, and respiratory tract irritation. Inhalation of fumes may cause metal-fume fever. The toxicological properties of this material have not been fully investigated.

Target Organs: No data found.

Potential Health Effects

Eye: Dust may cause mechanical irritation.

Skin: Prolonged and/or repeated contact may cause irritation and/or dermatitis.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Moderately toxic to humans by ingestion. The toxicological properties of this substance have not been fully investigated.

Inhalation: Effects may be delayed. May cause respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough,

Material Safety Data Sheets, Carver Hall RM 208-A

weakness, chest pain, muscle pain and increased white blood cell count. The toxicological properties of this substance have not been fully investigated. Can produce delayed pulmonary edema. Zinc oxide dust is considered to be of low toxicity and is classified as a nuisance particulate by the ACGIH. However, inhalation fumes or very fine dust may cause "zinc fume fever", which is characterized by flu-like symptoms with metallic taste, coughing, weakness, fatigue, muscular pain, and nausea, followed by fever and chills. Onset of symptoms occurs about 4-12 hours after exposure.

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.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material will not burn.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Use with adequate ventilation. Wash clothing before reuse. Avoid breathing dust.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use 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
Zinc oxide	2 mg/m ³ TWA (respirable fraction); 10 mg/m ³ STEL (respirable fraction)	5 mg/m ³ TWA (dust and fume) 500 mg/m ³ IDLH	5 mg/m ³ TWA (fume); 15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

OSHA Vacated PELs: Zinc oxide: 5 mg/m³ TWA (fume); 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white or yellow-white

Odor: odorless

pH: Not applicable.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 1975 deg C

Decomposition Temperature: Sublimes.

Solubility: Negligible in water

Specific Gravity/Density: 5.6

Molecular Formula: ZnO

Molecular Weight: 81.37

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.

Incompatibilities with Other Materials: Magnesium, chlorinated rubber.

Hazardous Decomposition Products: Toxic fumes of zinc oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1314-13-2: ZH4810000; ZH4817000

LD50/LC50:

CAS# 1314-13-2:

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, mouse: LC50 = 2500 mg/m³;

Oral, mouse: LD50 = 7950 mg/kg;

Carcinogenicity:

CAS# 1314-13-2: 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

Material Safety Data Sheets, Carver Hall RM 208-A

Ecotoxicity: No data available. No information available.

Environmental: No information available.

Physical: Testing of aquatic toxicity is not meaningful as solubility is poor.

Other: After exposing rainbow trout to zinc for a period of 30 days in river water, it was concluded that zinc accumulates in the gills, liver, kidney and opercular bone, but not the muscle.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL
Hazard Class:	XCP	9
UN Number:		UN3077
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1314-13-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

Material Safety Data Sheets, Carver Hall RM 208-A

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1314-13-2: immediate.

Section 313

This material contains Zinc oxide (listed as Zinc compounds), >99%, (CAS# 1314-13-2) 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 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# 1314-13-2 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1314-13-2 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:

N

Risk Phrases:

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 1314-13-2: 0

Canada - DSL/NDSL

CAS# 1314-13-2 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# 1314-13-2 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet

Zinc sulfate heptahydrate

ACC# 25580

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc sulfate heptahydrate

Catalog Numbers: AC205980000, AC205980010, AC205982500, AC424600000, AC424600030, AC424605000, NC9460712, Z68-3, Z68-500, Z76-12, Z76-3, Z76-500, Z76SAM1, Z76SAM2, Z76SAM3

Synonyms: White vitriol; zinc vitriol.

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
7446-20-0	Zinc sulfate, heptahydrate	99	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Warning! Causes severe eye irritation and possible eye injury. Causes skin and respiratory tract irritation. May be harmful if swallowed. Very toxic to aquatic organisms.

Target Organs: Respiratory system, eyes, skin.

Potential Health Effects

Eye: Contact may cause severe eye irritation and possible eye damage.

Skin: Causes skin irritation.

Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed.

Inhalation: Dust is irritating to the respiratory tract. May be harmful if inhaled.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. This material is a water pollutant and should not be emptied into drains.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid breathing dust.

Storage: Store in a cool, dry, 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
Zinc sulfate, heptahydrate	none listed	none listed	none listed
Zinc sulfate anhydrous	none listed	none listed	none listed

OSHA Vacated PELs: Zinc sulfate, heptahydrate: No OSHA Vacated PELs are listed for this chemical. Zinc sulfate anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to 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: 4.4-6 (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: 100 deg C

Decomposition Temperature: > 500 deg C

Solubility: Soluble in water

Specific Gravity/Density: 3.54 g/cm³ @ 25°C

Molecular Formula: ZnSO₄·7H₂O

Molecular Weight: 287.55

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Stable under normal temperatures and pressures. Efflorescent (tending to lose water molecules of hydration) in dry air.

Conditions to Avoid: Excess heat.

Incompatibilities with Other Materials: Strong bases.

Hazardous Decomposition Products: Oxides of sulfur, toxic fumes of zinc oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7446-20-0: ZH5300000

CAS# 7733-02-0: ZH5260000

LD50/LC50:

CAS# 7446-20-0:

Oral, mouse: LD50 = 200 mg/kg;

Oral, rat: LD50 = 1260 mg/kg;

CAS# 7733-02-0:

Draize test, rabbit, eye: 420 ug Moderate;

Oral, mouse: LD50 = 245 mg/kg;

Oral, rabbit: LD50 = 2 gm/kg;

Carcinogenicity:

CAS# 7446-20-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7733-02-0: 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

Ecotoxicity: No data available. No information available.

Environmental: Very toxic to aquatic organisms.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Zinc sulfate)
Hazard Class:	XCP	9
UN Number:		UN3077
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7446-20-0 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

CAS# 7733-02-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7733-02-0: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7446-20-0: immediate.

Section 313

This material contains Zinc sulfate, heptahydrate (listed as Zinc compounds), 99%, (CAS# 7446-20-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Zinc sulfate anhydrous (listed as Zinc compounds), -%, (CAS# 7733-02-0) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Material Safety Data Sheets, Carver Hall RM 208-A

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7733-02-0 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 7446-20-0 is listed as a Toxic Pollutant under the Clean Water Act. CAS# 7733-02-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7446-20-0 can be found on the following state right to know lists: California, (listed as Zinc compounds), New Jersey, (listed as Zinc compounds), Pennsylvania, (listed as Zinc compounds).

CAS# 7733-02-0 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 N

Risk Phrases:

R 22 Harmful if swallowed.

R 41 Risk of serious damage to eyes.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 22 Do not breathe dust.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

S 46 If swallowed, seek medical advice immediately and show this container or label.

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# 7446-20-0: 1

CAS# 7733-02-0: 1

Canada - DSL/NDSL

CAS# 7446-20-0 is listed on Canada's DSL List.

CAS# 7733-02-0 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

Material Safety Data Sheets, Carver Hall RM 208-A

CAS# 7446-20-0 is not listed on the Canadian Ingredient Disclosure List.

CAS# 7733-02-0 is listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Zinc Sulfide

ACC# 00860

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc Sulfide

Catalog Numbers: S79876, A4930888

Synonyms: Zinc monosulfide

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1314-98-3	Zinc sulfide	>99%	215-251-3

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: off-white solid.

Caution! Causes eye and skin irritation. Causes digestive and respiratory 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.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation: Dust is irritating to the respiratory tract. The toxicological properties of this substance have not been fully investigated.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Antidote: None reported.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.

Flash Point: Not applicable.

Autoignition Temperature: Not applicable.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 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. Avoid contact with skin and eyes. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Store in a tightly closed container. Keep away from water.

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
Zinc sulfide	none listed	none listed	none listed

OSHA Vacated PELs: Zinc sulfide: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate 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: off-white

Odor: none reported

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: 1185 deg C

Freezing/Melting Point:1700 deg C

Decomposition Temperature:Not available.

Solubility: .00069% @ 18 mmHg in water.

Specific Gravity/Density:3.98

Molecular Formula:ZnS

Molecular Weight:97.44

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Contact with acid liberates gas.

Conditions to Avoid: Incompatible materials, moisture, exposure to air, strong acids, strong oxidants.

Material Safety Data Sheets, Carver Hall RM 208-A

Incompatibilities with Other Materials: Reacts violently with iodine pentachloride.

Hazardous Decomposition Products: Oxides of sulfur, toxic fumes of zinc oxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1314-98-3: ZH5400000

LD50/LC50:

CAS# 1314-98-3:

Inhalation, rat: LC50 = >5040 mg/m³/4H;

Oral, rat: LD50 = >2 gm/kg;

Skin, rat: LD50 = >2 gm/kg;

Oral, Rat: LD50= >2

Carcinogenicity:

CAS# 1314-98-3: 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: No information found.

Physical: No information found.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1314-98-3 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

This material contains Zinc sulfide (listed as Zinc compounds), >99%, (CAS# 1314-98-3) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 1314-98-3 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# 1314-98-3 can be found on the following state right to know lists: California, (listed as Zinc compounds), New Jersey, (listed as Zinc compounds), Pennsylvania, (listed as Zinc compounds).

California Prop 65

Material Safety Data Sheets, Carver Hall RM 208-A

California No 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 31 Contact with acids liberates toxic gas.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 1314-98-3: 0

Canada - DSL/NDSL

CAS# 1314-98-3 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# 1314-98-3 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Zinc Nitrate Hexahydrate

ACC# 25470

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc Nitrate Hexahydrate

Catalog Numbers: S80248-2, Z45-500

Synonyms: Nitric Acid, Zinc Salt, Hexahydrate

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10196-18-6	Zinc Nitrate Hexahydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white crystals.

Danger! Strong oxidizer. Contact with other material may cause a fire. Harmful if swallowed. Causes eye and skin irritation. Hygroscopic (absorbs moisture from the air).

Target Organs: Eyes, skin.

Potential Health Effects

Eye: Causes eye irritation.

Skin: Causes skin irritation. May be harmful if absorbed through the skin.

Ingestion: Harmful if swallowed. May cause irritation of the digestive tract.

Inhalation: 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. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid if irritation or symptoms occur.

Inhalation: Remove from exposure and move to fresh air immediately. If 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. 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: 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: 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: Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Material Safety Data Sheets, Carver Hall RM 208-A

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 adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Zinc Nitrate Hexahydrate	none listed	none listed	none listed

OSHA Vacated PELs: Zinc Nitrate Hexahydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron. Wear appropriate clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystals

Appearance: white

Odor: odorless

pH: 5.1 in 5% solution.

Vapor Pressure: Not available.

Vapor Density: 10.3

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not applicable.

Freezing/Melting Point: 36.4 deg C

Decomposition Temperature: 105-131 deg C -

Solubility: Soluble in water.

Specific Gravity/Density: 2.065

Molecular Formula: Zn(NO₃)₂ · 6H₂O

Molecular Weight: 297.4702

Section 10 - Stability and Reactivity

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.

Conditions to Avoid: Incompatible materials, dust generation, combustible materials, moist air.

Incompatibilities with Other Materials: Strong reducing agents.

Hazardous Decomposition Products: Nitrogen oxides.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 10196-18-6: ZH4775000

LD50/LC50:

CAS# 10196-18-6:

Draize test, rabbit, eye: 20 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Severe;

Oral, mouse: LD50 = 926 mg/kg;

Oral, rat: LD50 = 1190 mg/kg;

Carcinogenicity:

CAS# 10196-18-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.

Environmental: No information 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.

Material Safety Data Sheets, Carver Hall RM 208-A

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ZINC NITRATE Zinc nitrate hexahydrate	ZINC NITRATE
Hazard Class:	5.1	5.1
UN Number:	UN1514	UN1514
Packing Group:	II	II
Additional Info:		Zinc nitrate hexahydrate

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10196-18-6 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)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 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 # 10196-18-6: immediate, fire.

Section 313

This material contains Zinc Nitrate Hexahydrate (listed as Zinc compounds), 100%, (CAS# 10196-18-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA. CAS# 10196-18-

Material Safety Data Sheets, Carver Hall RM 208-A

6 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10196-18-6 can be found on the following state right to know lists: California, (listed as Zinc compounds), New Jersey, (listed as Zinc compounds), Pennsylvania, (listed as Zinc compounds).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN O

Risk Phrases:

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 17 Keep away from combustible material.

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 10196-18-6: 1

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, 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# 10196-18-6 is not listed on the Canadian Ingredient Disclosure List.

Material Safety Data Sheet
Zirconium(IV) chloride, anhydrous

ACC# 52782

Section 1 - Chemical Product and Company Identification

MSDS Name: Zirconium(IV) chloride, anhydrous

Catalog Numbers: AC206410000, AC206410050, AC206411000, AC206415000

Synonyms: Zirconium chloride.

Company Identification:

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
10026-11-6	Zirconium(IV) chloride, anhydrous	98	233-058-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: fine powder.

Danger! Reacts violently with water. Causes burns by all exposure routes. Harmful if swallowed.

Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, liver, 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. Material releases hydrogen chloride on contact with water.

Chronic: May cause liver and kidney damage. In one inhalation study, exposure to zirconium tetrachloride (converted to zirconyl chloride in water) at a concentration of 6 mg Zr/m³ for 2 months was associated with a small increase in mortality of rats & guinea pigs and no increased mortality for rabbits, cats, or dogs. Respiratory infection subsequent to the inhaled zirconyl chloride mist was the reported cause of death. In 1-year inhalation studies with zirconium tetrachloride at 3.5 mg Zr/m³, no adverse effects on lab animals could be

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. Water reactive. Material will react with water and may release a flammable and/or toxic gas.

Extinguishing Media: Use foam, dry chemical, or carbon dioxide. DO NOT USE WATER!

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 2; Special Hazard: -W-

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 expose spill to water. Do not get water inside containers. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Do not allow water to get into the container because of violent reaction. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Handle under an inert atmosphere. Do not allow contact with water. Use only in a chemical fume hood.

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Storage: Store in a cool, dry place. Store in a tightly closed container. Corrosives area. Water free area. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Zirconium(IV) chloride, anhydrous	5 mg/m ³ TWA (as Zr) (listed under Zirconium compounds, n.o.s.).10 mg/m ³ STEL (as Zr) (listed under Zirconium compounds, n.o.s.).	5 mg/m ³ TWA (as Zr, except Zirconium tetrachloride) (listed under Zirconium compounds, n.o.s.).50 mg/m ³ IDLH (as Zr, except Zirconium tetrachloride) (listed under Zirconium compounds, n.o.s.).	5 mg/m ³ TWA (as Zr) (listed under Zirconium compounds, n.o.s.).

OSHA Vacated PELs: Zirconium(IV) chloride, anhydrous: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: 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 - fine

Odor: None reported.

pH: Not available.

Vapor Pressure: 1.3 hPa @ 190 deg C

Vapor Density: Not available.

Evaporation Rate:Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point:437 deg C(subl)

Decomposition Temperature:Not available.

Solubility: Insoluble.

Specific Gravity/Density:Not available.

Material Safety Data Sheets, Carver Hall RM 208-A

Molecular Formula: Cl₄Zr

Molecular Weight: 233.03

Section 10 - Stability and Reactivity

Chemical Stability: Reacts violently with water. 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: Amines, alcohols, acids, strong oxidizing agents.

Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 10026-11-6: ZH7175000

LD50/LC50:

CAS# 10026-11-6:

Oral, mouse: LD50 = 489 mg/kg;

Oral, rat: LD50 = 1688 mg/kg;

Carcinogenicity:

CAS# 10026-11-6: 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

Material Safety Data Sheets, Carver Hall RM 208-A

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ZIRCONIUM TETRACHLORIDE	ZIRCONIUM TETRACHLORIDE
Hazard Class:	8	8
UN Number:	UN2503	UN2503
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 10026-11-6 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

CAS# 10026-11-6: 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 # 10026-11-6: immediate, reactive.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 10026-11-6 is listed as a Hazardous Substance under the CWA.

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None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 10026-11-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Zirconium compounds, n.o.s.), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 14 Reacts violently with water.

R 22 Harmful if swallowed.

R 34 Causes burns.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 8 Keep container dry.

WGK (Water Danger/Protection)

CAS# 10026-11-6: No information available.

Canada - DSL/NDSL

CAS# 10026-11-6 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of E, F, 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# 10026-11-6 is listed on the Canadian Ingredient Disclosure List.