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MSDS

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K63645

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**** MATERIAL SAFETY DATA SHEET ****

Copper (II) Sulfate Anhydrous

MSDS Name: Copper (II) Sulfate Anhydrous

Catalog Numbers: C495-500

Synonyms: Cupric monosulfate; Cupric sulfate; Cupric sulfate anhydrous;

Sulfuric acid, copper(2+) salt (di)

Company Identification: Fairmount Chemical

Fairlawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

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

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	ELNCS#
7758-98-7	Copper(II) sulfate	>97	231-847-6

Hazard Symbols: XN N

Risk Phrases: 22 36/38 50/53

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: light gray.

Warning: Hygroscopic. Air sensitive. This substance has caused

adverse reproductive and fetal effects in animals. Harmful if

swallowed. Causes eye and skin irritation and possible burns. Causes

digestive and respiratory tract irritation with possible burns.

Target Organs: Blood, Kidneys, liver.

Potential Health Effects

Eye: Exposure to particulates or solution may cause conjunctivitis,

ulceration, and corneal abnormalities. Causes eye irritation and

possible burns.

Skin: Causes skin irritation and possible burns. May cause itching eczema.

Ingestion: Harmful if swallowed. May cause gastrointestinal irritation with

nausea, vomiting and diarrhea. 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 system excitation followed by depression.

Inhalation: use ulceration and perforation of the nasal septum if inhaled

in excessive quantities. Causes respiratory tract irritation with

possible burns.

Chronic: May cause liver and kidney damage. May cause anemia and other blood

cell abnormalities. May cause reproductive and fetal effects.

Individuals with Wilson's disease are unable to excrete copper.

Thus, copper accumulation and may result in liver,

kidney and brain damage. Laboratory experiments have resulted in

mutagenic effects. Chronic copper poisoning in man is recognized in

the form of Wilson's disease.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes,

occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of soap and 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. Do NOT 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

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:

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**** SECTION 5 - FIRE FIGHTING MEASURES ****

Individuals with Wilson's disease are more susceptible to chronic

copper poisoning.

Antidote: The use of d-penicillamine as a chelating agent should be determined

by qualified medical personnel.

General Information: As in any fire, wear a self-contained breathing apparatus in

pressure-demand, NIOSH approved type. Avoid breathing full

strength dusts. Dusts cause eye irritation 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.

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

Autoignition Temperature: Not available.

Flash Point: None. Lower: Not available.

Explosion Limits: Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Reactivity: 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: 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. Do not ingest or inhale.

Store in a tightly closed container. Store in a cool, dry, not expose

well-ventilated area away from incompatible substances. Do not expose

to 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
Copper(II) sulfate	0.2 mg/m3 TWA (fume); 1 mg/m3 TWA dusts and fume (listed under ** no name **).	as Cu; 1 mg/m3 as Cu; 1 mg/m3 TWA (dusts and fume); 1 mg/m3 TWA (fume) (listed under ** no name **); dusts as mists as Cu: 100 mg/m3 IDLH (listed under ** no name **).	0.1 mg/m3 TWA (fume); 1 mg/m3 TWA dusts (listed under ** no name **).

OSHA Vacated PELs: Copper(II) sulfate: 0.1 mg/m3 TWA (fume, dusts, mists as Cu) (listed under ** no name **)

Personal Protective Equipment

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

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Exposure Limits

- CAS# 7758-98-7: 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 0.2 mg(Cu)/m3 (dust)
- OEL-FINLAND:TWA 1 mg(Cu)/m3 (fume)
- OEL-FINLAND:TWA 1 mg(Cu)/m3 (dust)
- OEL-FINLAND:TWA 0.2 mg(Cu)/m3 (fume)
- OEL-FRANCE:TWA 1 mg(Cu)/m3 (dust)
- OEL-FRANCE:TWA 0.2 mg(Cu)/m3 (fume)
- OEL-FRANCE:TWA 1 mg(Cu)/m3;STEL 2 mg(Cu)/m3 (dust)
- OEL-GERMANY:TWA 1 mg(Cu)/m3 (dust)
- OEL-GERMANY:TWA 0.2 mg(Cu)/m3 (fume)
- OEL-INDIA:TWA 0.2 mg(Cu)/m3 (fume)
- OEL-INDIA:TWA 0.4 mg(Cu)/m3 (dust)
- OEL-THE NETHERLANDS: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)
- OEL-THE PHILIPPINES:TWA 1.0 mg(Cu)/m3 (dust)
- OEL-POLAND:TWA 0.1 mg(Cu)/m3 (fume)
- OEL-POLAND:TWA 0.5 mg/m3
- OEL-RUSSIA:STEL 0.5 ppm (1 mg(Cu)/m3) (dust) JANS
- OEL-RUSSIA:STEL 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:TWA 0.1 mg(Cu)/m3;STEL 0.2 mg(Cu)/m3 (fume)
- OEL-SWITZERLAND:TWA 1 mg(Cu)/m3;STEL 1 mg(Cu)/m3
- OEL-THAILAND:TWA 0.1 mg(Cu)/m3 (fume)
- OEL-THAI

**** SECTION 16 - ADDITIONAL INFORMATION ****
MSDS Creation Date: 7/09/1999 Revision #3 Date: 8/31/2001

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 way shall the company be liable for any special, indirect or consequential damages, incidental or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

*** MATERIAL SAFETY DATA SHEET ***

Copper (I) Chloride
 05720

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Copper (I) Chloride
 Catalog Numbers: 879988-1, C457-500, S799881
 Synonyms: Cuprous Chloride; Dicopper Dichloride; Cuprous Chloride; Cuprous Dichloride.
 Company Identification: Fisher Scientific
 1 Reagent Lane
 Fairlawn, NJ 07410
 For information, call: 201-726-7100
 Emergency assistance, call: 800-424-9300
 SHENREC assistance, call: 800-424-9300
 For International CHEMREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	HSINCS#
7758-99-6	COPPER (I) CHLORIDE	100	231-842-9

Hazard Symbols: XN N
 Risk Phrases: 22 50/53

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: green gray, sensitive. Air sensitive. Moisture sensitive. Harmful if swallowed. Causes eye and skin burns. May cause liver and kidney damage. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns.
 Target Organs: Kidneys, liver.
 Potential Health Effects
 Eyes: Causes eye burns.
 Skin: Causes skin burns.
 Ingestion:
 Harmful if swallowed. May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause liver and kidney damage.
 Inhalation:
 May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract.
 Chronic:
 May cause liver and kidney damage.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).
 Skin: Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated clothing.
 Ingestion:
 Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupsful 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. If not use artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
 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. 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 extinguishing media appropriate to the surrounding fire. Substance is noncombustible. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated.
 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.
 Autoignition Temperature: Not applicable.
 Flash Point: Not applicable.
 Explosion Limits: Lower: Not available.
 NFPA Rating: (estimated) Health: 3; Flammability: 0; Reactivity: 0

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in section 8.
 Spills/Leaks:
 Clean up spills into storm sewers and ditches which lead to waterways. Equipment section. Sweep up, then place into a suitable container for disposal. Provide ventilation. Place under an inert atmosphere. Do not get water inside containers.

**** SECTION 7 - HANDLING AND STORAGE ****

Handling:
 Minimize dust generation and accumulation. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Use with adequate ventilation. Store protected from light. Handle under an inert atmosphere. Store protected from air. Do not allow contact with water. Wash clothing before reuse. Discard contaminated shoes. Keep from contact with moist air and steam.
 Storage:
 Do not store in direct sunlight. Store in a tightly closed container. Store in cool, dry, well-ventilated area away from incompatible substances. Corrosive area. Do not store in metal containers. Do not expose to air. Store protected from moisture. Store protected from light. Store under an inert atmosphere. Material darkens on exposure to air.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:
 Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
 Exposure Limits
 Chemical Name: COPPER (I) CHLORIDE
 ACGIH: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (dusts and mists) (listed under ** no name **)
 NIOSH: as Cu: 1 mg/m³ TWA (dusts and mists); 0.1 mg/m³ TWA (fume) (listed under ** no name as mists as mg/m³ TWA (listed under ** no name **))
 OSHA: 0.1 mg/m³ TWA (fume); 1 mg/m³ TWA (dusts and mists) (listed under ** no name **)

OSHA Vacated PELs:
 COPPER (I) CHLORIDE:
 0.1 mg/m³ TWA (fume, dusts, mists as Cu) (listed under ** no name **)

Personal Protective Equipment
 Eyes:
 Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations 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.

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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.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Crystals
Appearance: none reported
Color: green gray
pH: Not available.
Vapor Pressure: Not available.
Volatility: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not available.
Boiling Point: 1490 deg C
Freezing/Melting Point: 430 deg C
Decomposition Temperature: Not available.
Solubility in water: Slightly soluble.
Specific Gravity/Density: CuCl
Molecular Weight: 98.999

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Darkens on exposure to light and air.
Conditions: Incompatible materials, light, dust generation, moisture, exposure to air, metals, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, strong bases, potassium, lithium, heat.
Hazardous Decomposition Products: Hydrogen chloride, irritating and toxic fumes and gases, chloride
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#: CAS# 7758-89-6: CL6990000
LD50/LC50: 7758-89-6: Inhalation, mouse: LC50 = 1008 mg/m3; Oral, mice: LD50 = 347 mg/kg; Oral, rat: LD50 = 140 mg/kg.
Carcinogenicity: COPPER (I) CHLORIDE - 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 data available.
Other Studies: No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. None listed.
RCRA U-Series: None listed.
RCRA U-Residuals: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT Shipping Name: COPPER CHLORIDE
Hazard Class: UN2802
Packaging Group: III
Canadian TDG Shipping Name: COPPER CHLORIDE
Hazard Class: 8
UN Number: UN2802

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**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL TSCA
CAS# 7758-89-6 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 of the 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
Section 302 (RQ)
None of the chemicals in this material have an RQ.
Section 302 (TFQ)
None of the chemicals in this product have a TFQ.
SARA 309
CAS# 7758-89-6: acute, chronic.

Section 313
This material contains COPPER (I) CHLORIDE (listed as ** undefined **), 100%. (CAS# 7758-89-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 or Class 2 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# 7758-89-6 is listed as a Priority Pollutant under the Clean Water Act.
CAS# 7758-89-6 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
COPPER (I) CHLORIDE can be found on the following state right to know lists: California, (listed as ** no name **), California, (listed as ** no name **), New Jersey, (listed as ** no name **), Florida, (listed as ** no name **), Pennsylvania, (listed as ** no name **), no name **, (listed as ** no name **), Massachusetts, (listed as ** no name **).

California No Significant Risk Level:
None of the chemicals in this product are listed.
European/International Regulations
European Labeling in Accordance
Hazard Symbols: XN N

Risk Phrases: R 22 Harmful if swallowed.
R 50/53 very toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.
Safety Phrases: S 22 Do not breathe dust.
S 60 This material and/or its container must be disposed of as hazardous waste.
S 61 This material and its container must be stored in accordance with special instructions/Safety data sheets.

WGK (Water Danger/Protection)
CAS# 7758-89-6: 2
United Kingdom Occupational Exposure Limits
CAS# 7758-89-6: OES-United Kingdom, TWA (listed as ** undefined **); fumes; 0.2 ppm TWA; dusts and mists, as Cu: 1 mg/m3 TWA
CAS# 7758-89-6: OES-United Kingdom STEL (listed as ** undefined **); dusts and mists, as Cu: 2 mg/m3 STEL

Canada
CAS# 7758-89-6 is listed on Canada's DSL List.
This product has a WHMIS classification of D1B.
CAS# 7758-89-6 is listed on Canada's Ingredient Disclosure List.
Exposure Limits
OEL-AUSTRIA: TWA 0.2 mg (Cu)/m3 (dust)
OEL-AUSTRALIA: TWA 0.2 mg (Cu)/m3 (dust)
OEL-BELGIUM: TWA 1 mg (Cu)/m3 (dust)
OEL-BELGIUM: TWA 1 mg (Cu)/m3 (dust)
OEL-DENMARK: TWA 0.1 mg (Cu)/m3 (fume)
OEL-DENMARK: TWA 1 mg (Cu)/m3 (dust)
OEL-FINLAND: TWA 0.2 mg (Cu)/m3 (fume)
OEL-FINLAND: TWA 1 mg (Cu)/m3 (dust)
OEL-FINLAND: TWA 1 mg (Cu)/m3 (dust)
OEL-FRANCE: TWA 0.2 mg (Cu)/m3 (fume)
OEL-FRANCE: TWA 2 mg (Cu)/m3 (dust)
OEL-FRANCE: TWA 1 mg (Cu)/m3 (fume)
OEL-GERMANY: TWA 0.1 mg (Cu)/m3 (fume)
OEL-GERMANY: TWA 1 mg (Cu)/m3 (dust)
OEL-HUNGARY: TWA 0.2 mg (Cu)/m3; STEL 0.4 mg (Cu)/m3 (dust)

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*** MATERIAL SAFETY DATA SHEET ***

Cobalt Chloride
91786

*** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ***

MSDS Name: Cobalt Chloride
Catalog No.: AC 1530CL, 575088
Synonyms: Cobaltous dichloride; Cobalt muriate.
Company Identification: Fisher Scientific
1 Reagent Lane
Fairfield, NJ 07410
For information, call: 800-424-9300
Emergency assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

*** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ***

CAS#	Chemical Name	%	ELINECS#
7646-79-9	Cobaltous chloride	100	231-599-4

Hazard Symbols: T N
Risk Phrases: 22 42/43 49 50/53

*** SECTION 3 - HAZARDS IDENTIFICATION ***

EMERGENCY OVERVIEW

Appearance: clear light-blue.
Irritation: Causes eye irritation. Chronic exposure may result in sensitization.
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.
Target Organs: Lungs, cardiovascular system, skin.
Potential Health Effects
Eye: Causes eye irritation.
Skin: Causes skin irritation.
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 soap and 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 cupsful 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.
Notes to Physician: Use of chelators such as BAL, penicillamine and N-acetylcysteine 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 generated. Air may be contaminated. Combustion can spread along the ground and collect in low or confined areas.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam. Autoignition Temperature: Not available.
Flash Point: Not available.

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Explosion Limits, lower: Not available.

Explosion Limits, upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Reactivity: 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.
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 (listed under ** no name **).	as Co: 0.05 mg/m ³ TWA (listed under ** no name **). mg/m ³ IDLH Co: 20 (listed under ** no name **).	0.1 mg/m ³ TWA (list and name) ** no name **.

OSHA Vacated PELs:
Cobaltous chloride:
as Co: 0.05 mg/m³ TWA (listed under ** no name **)

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical 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. Use 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.

*** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ***

Physical State: Solid light-blue
Appearance: slight - sharp odor
Color: Not available.
pH: 40 mm H₂ @ 770C
Vapor Pressure: 4.5
Vapor Density: Not available.
Evaporation Rate: Not available.
Boiling Point: 729 deg C @ 760 mmHg
Freezing/Softening Point: 400C (sublimes)
Stability in water: 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:
Chlorine chloride, chlorine, irritating and toxic fumes and gases,
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS# : CAS# 7646-79-9: GF9800000
LD50 : CAS# 7646-79-9: Oral, mouse: LD50 = 80 mg/kg; Oral, rat: LD50 = 80 mg/kg.
Cobaltous chloride
Carcinogenicity:
ACGIH: A3 - Animal Carcinogen (listed as ** undefined **).
California: carcinogen; initial date 7/1/92 (listed as ** undefined **).
OSHA: Possible select carcinogen (listed as ** undefined **).
IARC: Group 2B carcinogen (listed as ** undefined **).

Epidemiology: None listed.
No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: No information available.
Other Studies: No information available.
No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate disposal information.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT Shipping Name: Toxic Solid, Inorganic, N.O.S.
Hazard Class: UN2288
Packaging Group: III
Canadian TDG No information available.

**** 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
Section 12: The chemicals in this product are under a Chemical Test Rule.
Section 11: The 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 Section 302 (RQ)
None of the chemicals in this material have an RQ.
Section 304 (TFQ)
None of the chemicals in this product have a TFQ.

SARA Codes
CAS # 7646-79-9: acute, chronic, reactive.

Section 313
This material contains cobaltous chloride (listed as ** undefined **), 100%. (CAS# 7646-79-9) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR part 372.

Clean Air Act
CAS# 7646-79-9 listed as ** no name ** 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 under the CWA.

STATE

Cobaltous chloride can be found on the following state right to know lists: California, (listed as ** no name **), New Jersey, (listed as ** no name **), Florida, (listed as ** no name **), Pennsylvania, (listed as ** no name **), Minnesota, (listed as ** no name **), Massachusetts, (listed as ** no name **), (are) made in order to comply with the California Safe Drinking Water Act.
WARNING: This product contains cobaltous chloride, listed as ** undefined **, 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
None of the chemicals in this product are listed.

European Labeling in Accordance with EC Directives
None of the chemicals in this product are listed.

Risk Phrases: T N

R 42/43 Harmful if swallowed.

R 49 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 53 Avoid exposure - obtain special instructions before use.

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

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

WGK (Water Danger/Protection)
CAS# 7646-79-9: 2

United Kingdom Occupational Exposure Limits

Canada

CAS# 7646-79-9 is listed on Canada's DSL List.
This product has a MEMS classification of D1B1, D2B1.

CAS# 7646-79-9 is listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 7646-79-9 (listed as ** undefined **): OEL-ARAB Republic of Egypt

:TWA 0.1 mg/m3

OEL-AUSTRALIA:TWA 0.05 mg/m3

OEL-BELGIUM:TWA 0.05 mg/m3

OEL-CANADA:TWA 0.05 mg/m3

OEL-DENMARK:TWA 0.05 mg/m3

OEL-FINLAND:TWA 0.05 mg/m3;SKIN

OEL-GERMANY:Carcinogen

OEL-HUNGARY:TWA 0.1 mg/m3;STEL 0.2 mg/m3

OEL-THE NETHERLANDS:TWA 0.1 mg/m3

OEL-NORWAY:TWA 0.1 mg/m3

OEL-POLAND:TWA 0.05 mg/m3

OEL-RUSSIA:TWA 0.05 mg/m3

OEL-SWEDEN:TWA 0.1 mg/m3;Carcinogen

OEL-SWITZERLAND:TWA 0.1 mg/m3

OEL-UNITED KINGDOM:TWA 0.1 mg/m3

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: 4/12/2001 Revision #3 Date: 2/04/2002

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of information, liability or any other warranty, express or implied, with respect to such information. Users are advised to consult the Safety Data Sheet. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company 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, however arising, even if the company has been advised of the possibility of such damages.

DATE: 05/09/07
INDEX: S2423433
MCCN: 418643002
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- OEL-INDIA:TWA 0.2 mg(Cu)/m3 (fume)
- OEL-THE NETHERLANDS: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-INDIA:TWA 0.1 mg(Cu)/m3 (dust) JAN9
- OEL-RUSSIA:STEL 0.5 mg/m3 (1 mg(Cu)/m3) (dust) JAN9
- OEL-RUSSIA:STEL 5 mg/m3 (resp. dust)
- OEL-SWEDEN:TWA 0.2 mg(Cu)/m3 (total dust)
- OEL-SWEDEN:TWA 0.2 mg(Cu)/m3 (fume)
- OEL-SWEDEN:TWA 1 mg(Cu)/m3 (total dust)
- OEL-SWITZERLAND:TWA 0.1 mg(Cu)/m3;STEL 0.2 mg(Cu)/m3 (fume)
- OEL-SWITZERLAND:TWA 1 mg(Cu)/m3;STEL 1 mg(Cu)/m3
- OEL-THAILAND:TWA 0.1 mg(Cu)/m3 (fume)
- OEL-THAILAND

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 2/19/1998 Revision #3 Date: 10/06/2000

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