

Mallinckrodt

## CUPRIC SULFATE

## Material Safety Data Sheet

Mallinckrodt Inc.  
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Emergency Telephone Number  
314-982-5000

Effective Date: 08-05-85

PRODUCT IDENTIFICATION:

Synonyms: Copper (II) Sulfate Pentahydrate (1:1:5); blue vitriol; Sulfuric acid copper (2+) salt (1:1), Pentahydrate

Formula CAS No.: 7758-99-8 (Hydrated)  
TSCA CAS No.: 7758-98-7 (Anhydrous)

Molecular Weight: 249.68

Hazardous Ingredients:  
Not applicable.

Chemical Formula:  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ PRECAUTIONARY MEASURES

WARNING! HARMFUL IF SWALLOWED. CAUSES IRRITATION.

Avoid contact with eyes, skin and clothing.  
Wash thoroughly after handling.

EMERGENCY/FIRST AID

If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes.  
In all cases call a physician.

SEE SECTION 5.

DOT Hazard Class: ORM-E

Physical DataSECTION 1

Appearance: Transparent blue triclinic crystals or crystalline granules or powder.

Odor: Odorless.

Solubility: 24.3g/100g  $\text{H}_2\text{O}$  @ 30°C (86°F)

Boiling Point: > 400°C (752°F) decomposes

Vapor Density (Air=1): No information found.

Melting Point: Loses water @ 110°C (230°F)

Vapor Pressure (mm Hg): No information found.

Specific Gravity: 2.28

Evaporation Rate: (water=1):  
slowly efflorescent.

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Fire and Explosion InformationSECTION 2

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.  
Sealed container may rupture during fire conditions from pressure water vapor release.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. When heated above 110°C (230°F) material will melt. Avoid using a direct water stream on molten material as it may cause splattering.

Reactivity DataSECTION 3

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition  
Products:

When heated to decomposition cupric oxide and sulfur oxide may form.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

At temperatures greater than 250°C (482°F) the anhydrous salt will ignite hydroxylamine. Solutions are acidic and can react with magnesium to evolve flammable hydrogen gas.

Leak/Spill Disposal Information SECTION 4

Ventilate area of leak or spill. Clean-up personnel require protective clothing and respiratory protection from dust.

Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate dust.

Disposal: Whatever cannot be saved for reclamation may be disposed in an RCRA approved hazardous waste facility.

Reportable Quantity (RQ) (CWA/CERCLA) : 10 lbs. Anhydrous

Ensure compliance with local, state and federal regulations.



# Health Hazard Information

## SECTION 5

### 5.1 Exposure/Health Effects

**Inhalation:** May cause irritation to the upper respiratory tract; symptoms may include coughing, sore throat, and shortness of breath. May also cause symptoms similar to the common cold; including chills and stuffiness of the head.

**Ingestion:** Toxic! May cause burning pain in the mouth, esophagus, and stomach. Hemorrhagic gastritis, nausea, vomiting, abdominal pain, metallic taste, and diarrhea may occur. If vomiting does not occur immediately systemic copper poisoning may occur. Symptoms may include capillary damage, headache, cold sweat, weak pulse, kidney and liver damage, central nervous excitation followed by depression, jaundice, convulsions, paralysis and coma. Death may occur from shock or renal failure.

**Skin Contact:** May cause irritation and itching.

**Eye Contact:** Dust may cause irritation. Contact may cause conjunctivitis, ulceration, or clouding of the cornea.

**Chronic Exposure:** Prolonged or repeated skin exposure may cause dermatitis. Prolonged or repeated exposure to dusts of copper salts may cause discoloration of the skin or hair, ulceration and perforation of the nasal septum, runny nose, metallic taste, and atrophic changes and irritation of the mucous membranes.

**Aggravation of Pre-existing Conditions:** Persons with pre-existing skin disorders or impaired liver, kidney, or pulmonary function or pre-existing Wilson's disease may be more susceptible to the effects of this material.

### A. FIRST AID

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:** If swallowed, induce vomiting immediately by giving two glasses of water, or milk if available and sticking finger down throat. Call a physician immediately. Never give anything by mouth to an unconscious person.

**Skin Exposure:** Remove any contaminated clothing. Wash skin with plenty of water for at least 15 minutes. If irritation develops, get medical attention.

**Eye Exposure:** Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

### G. TOXICITY DATA (RTECS, 1982)

Oral rat LD50: 300 mg/kg. Mutation references cited.

# Occupational Control Measures

## SECTION 6

**Airborne Exposure Limits:** OSHA Permissible Exposure Limit (PEL):  
1mg(Cu)/m<sup>3</sup> ppm (TWA)  
ACGIH Threshold Limit Value (TLV):  
1mg(Cu)/m<sup>3</sup> (TWA)  
2mg(Cu)/m<sup>3</sup> (STEL).

**Ventilation System:** A system of local exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the dust or vapor at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

**Personal Respirators:** (NIOSH Approved) If the TLV is exceeded, a dust/mist respirator with chemical goggles may be worn, in general, up to ten times the TLV. Consult respirator supplier for limitations. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.

**Skin Protection:** Wear protective gloves and clean body-covering clothing.

**Eye Protection:** Use chemical safety goggles. Contact lenses should not be worn when working with this material.  
  
Maintain eye wash fountain and quick-drench facilities in work area.

# Storage and Special Information SECTION 7

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Solutions are corrosive to mild steel.

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