



## Section 1 – Identification

**MSDS Name:** Copper (II) sulfate pentahydrate  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ .

**Catalog Numbers:** 4107, 4110, 14550, 14555, 14630, 14640, 14645, 14665, 14807, 14909, 15100, 15102, 15104, 15105, 15108, 15109, 15210, 15301, 15620, 15625, 16825, 16906, 17003, 17105, 17207, 17225, 17240, 17250, 17270, 17280, TRI014, TRI015. SIN015, SIN0155.

**Synonyms:** Blue Vitriol.

**Company Identification:**

M.C. Miller CO.  
11640 U.S. Hwy 1  
Sebastian, Florida 32958

**For information, call:** 1-772-794-9448

**Fax Number:** 1-772-589-9072

## 2 – Hazard(s) Identification

**Signal Word:** **Danger**



### **Pictograms:**

### **Emergency Overview**

Appearance: blue crystals.

**Warning!** Harmful if swallowed. Causes eye and skin irritation and possible burns. Causes digestive and respiratory tract irritation with possible burns. Hygroscopic (absorbs moisture from the air). Severe marine pollutant.

**Target Organs:** Blood, kidneys, liver.

### **Potential Health Effects**

**Eye:** Exposure to particulates or solution may cause conjunctivitis, ulceration, and corneal abnormalities. Causes eye irritation and possible burns.

**Skin:** Causes skin irritation and possible burns.

**Ingestion:** Harmful if swallowed. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns.

Ingestion of large amounts of copper salts may cause bloody stools and vomit, low blood pressure, jaundice and coma. Ingestion of copper compounds may produce systemic toxic effects to the kidney and liver and central nervous excitation followed by

depression.

**Inhalation:** May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Causes respiratory tract irritation with possible burns.

**Chronic:** May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Individuals with Wilson's disease are unable to metabolize copper. Thus, copper accumulates in various tissues and may result in liver, kidney, and brain damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Chronic copper poisoning in man is recognized in the form of Wilson's disease.

### Section 3 – Composition/Information on Ingredients

CAS#	Chemical Name	%	EINECS/ELINCS
7758-99-8	Copper (II) Sulfate Pentahydrate	99.8	231-847-6

**Hazard Symbols:** XN    **Risk Phrases:** 22 36/38

### Section 4 – First-Aid Measures

**Eyes:** Immediately flush eyes with plenty of room temperature water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If symptoms persists, after 15 minutes of irrigation, 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.

**Notes to Physician:** Individuals with Wilson's disease are more susceptible to chronic copper poisoning.

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

### Section 5 – Fire-Fighting Measures

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

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

**Flash Point:** Not applicable.

**Autoignition Temperature:** Not applicable.

**Explosion Limits, Lower:** Not available.

**Upper Flammable Limit (UFL):** Not available.

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

Hazard Scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

### Section 6 – Accidental Release Measures

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

**Spills/Leaks:** Vacuum or sweep up material and place into a suitable disposal container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. U.S. regulations require reporting spills and releases to soil, water and air in excess of reportable quantities.

**Section 7 – Handling and Storage**

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

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

**Section 8 – Exposure Controls/Personal Protection**

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

**Exposure Limits**

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Copper(II) sulfate pentahydrate	none listed	1 mg/m <sup>3</sup> TWA (as Cu, except Copper fume) (listed under Copper compounds, n.o.s.).	none listed

**OSHA Vacated PELs:** Copper (II) sulfate pentahydrate: No OSHA Vacated PELs are listed for this chemical.

**Personal Protective Equipment**

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 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 Crystals  
**Appearance:** Blue  
**Odor:** Odorless  
**pH:** 3.7-4.2 (10% soln.)  
**Vapor Pressure:** 7.3 mm Hg @ 25 deg C  
**Vapor Density:** 8.6  
**Evaporation Rate:** Negligible.  
**Viscosity:** Not available.  
**Boiling Point:** 560 deg C (1040deg F) (decomposes)  
**Freezing/Melting Point:** 150 deg C (302 deg F)  
**Molecular Weight:** 249.68  
**Solubility (H<sub>2</sub>O):** Soluble. 31.6 g/100cc (@ 0 deg C)  
**Specific Gravity/Density:** 2.2840g/cm<sup>3</sup>  
**Molecular Formula:** CuO<sub>4</sub>.5H<sub>2</sub>O

## Section 10 – Stability and Reactivity

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

**Conditions to Avoid:** High temperatures, dust generation, exposure to moist air or water.

**Incompatibilities with Other Materials:** Aqueous solution of copper (2+) sulfate is an acid. Incompatible with strong bases, hydroxylamine, magnesium.

**Hazardous Decomposition Products:** Oxides of sulfur, copper Oxides.

**Hazardous Polymerization:** Has not been reported

## Section 11 – Toxicological Information

**RTECS#:**

**CAS#** 7758-99-8: GL8900000

**LD50/LC50:**

**CAS#** 7758-99-8:

Oral, mouse: LD<sub>50</sub> = 369 mg/kg;

Oral, rat: LD<sub>50</sub> = 33

0 mg/kg;

Skin, rat: LD<sub>50</sub> = >2 gm/kg;

**Carcinogenicity:**

**CAS#** 7758-99-8: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** No information available.

**Teratogenicity:** There are no reports of Teratogenicity in humans. Animal studies indicate that a deficiency or excess copper in the body can cause significant harm to developing embryos. The net absorption of copper is limited and toxic levels are unlikely from industrial exposure.

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

**Mutagenicity:** See actual entry in RTECS for complete information.

**Neurotoxicity:** Has not been Identified

## Section 12 – Ecological Information

**Ecotoxicity:** Fish: Rainbow trout: LC50 = 0.1-2.5 mg/L; 96 Hr; Unspecified Fish: Bluegill/Sunfish: LC50 = 0.6 mg/L; 48 Hr; 15 mg/L CaCO<sub>3</sub>Fish: Bluegill/Sunfish: LC50 = 8.0 mg/L; 48 Hr; 68 mg/L CaCO<sub>3</sub>Fish: Bluegill/Sunfish: LC50 = 10.0 mg/L; 48 Hr; 100 mg/L CaCO<sub>3</sub>Fish: Bluegill/Sunfish: LC50 = 45.0 mg/L; 48 Hr; 132 mg/L CaCO<sub>3</sub> In soil, copper sulfate is partly washed down to lower levels, partly bound by soil components, and partly oxidatively transformed. Copper has a strong affinity for hydrous iron and manganese oxides, clays, carbonate minerals, and organic matter. Sorption to these materials ... suspended in the water column & in the bed sediments, results in relative enrichment of the solid phase and reduction in dissolved levels.

**Environmental:** Copper is accumulated by plants and animals, but it does not appear to biomagnify from plants to animals. This lack of biomagnification appears common with heavy metals. In air, copper aerosols (in general) have a residence time of 2 to 10 days in an unpolluted atmosphere and 0.1 to > 4 days in polluted, urban areas.

**Physical:** No evidence was found to indicate that there is any biotransformation process for copper compounds which would have a significant bearing on the fate of copper in aquatic environments.

**Other:** Has fungicidal properties.

### Section 13 – Disposal Considerations

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

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

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

### Section 14 – Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	Environmentally Hazardous Solid, n.o.s. Copper Sulfate Pentahydrate	Environmentally Hazardous Solid, n.o.s. Copper Sulfate Pentahydrate
<b>Hazard Class:</b>	9	9
<b>UN Number:</b>	UN3077	UN3077
<b>Packing Group:</b>	III	III

### Section 15 – Regulatory Information

#### US Federal Regulations

##### TSCA

CAS# 7758-99-8 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.

##### SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

**SARA Codes**

CAS # 7758-99-8: immediate, delayed.

**Section 313**

This material contains Copper(II) sulfate pentahydrate (listed as Copper compounds, n.o.s.), 100%, (CAS# 7758-99-8) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

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**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 Priority Pollutants under the CWA. CAS# 7758-99-8 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# 7758-99-8 can be found on the following state right to know lists: California, (listed as Copper compounds, n.o.s.), New Jersey, (listed as Copper compounds, n.o.s.), Pennsylvania, (listed as Copper compounds, n.o.s.).

**California Proposition 65**

Copper Sulfate Pentahydrate is not on the California Proposition 65 chemical lists.

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

XN N

**Risk Phrases:**

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

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

**Safety Phrases:**

S 22 Do not breathe dust.

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

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

**WGK (Water Danger/Protection)****Canada - WHMIS**

This product has a WHMIS classification of D1B, D2B.

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

**Canadian Ingredient Disclosure List**

CAS# 7758-99-8 (listed as Copper compounds, n.o.s.) is listed on the Canadian Ingredient Disclosure List.

**Section 16 – Additional Information****MSDS Creation Date:** 11/14/2001

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