



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 ³ 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 (H₂O):	Soluble. 31.6 g/100cc (@ 0 deg C)
Specific Gravity/Density:	2.2840g/cm ³
Molecular Formula:	CuO ₄ .5H ₂ 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: LD₅₀ = 369 mg/kg;

Oral, rat: LD₅₀ = 33

0 mg/kg;

Skin, rat: LD₅₀ = >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 CaCO₃Fish: Bluegill/Sunfish: LC50 = 8.0 mg/L; 48 Hr; 68 mg/L CaCO₃Fish: Bluegill/Sunfish: LC50 = 10.0 mg/L; 48 Hr; 100 mg/L CaCO₃Fish: Bluegill/Sunfish: LC50 = 45.0 mg/L; 48 Hr; 132 mg/L CaCO₃ 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

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

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

14.1. UN number

UN-No.(DOT) : 3077
DOT NA no. UN3077

14.2. UN proper shipping name

DOT Proper Shipping Name : Environmentally hazardous substances, solid, n.o.s.
Department of Transportation (DOT) Hazard
Classes
: 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140
Hazard labels (DOT) : 9 - Miscellaneous dangerous substances and articles



: III - Minor Danger

Packing group (DOT) : III - Minor Danger

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Copper (II) Sulfate, Pentahydrate
Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
DOT Special Provisions (49 CFR 172.102) : 8 - A hazardous substance that is not a hazardous waste may be shipped under the shipping

description "Other regulated substances, liquid or solid, n.o.s.", as appropriate. In addition, for solid materials, special provision B54 applies.

146 - This description may be used for a material that poses a hazard to the environment but does not meet the definition for a hazardous waste or a hazardous substance, as defined in 171.8 of this subchapter, or any hazard class as defined in Part 173 of this subchapter, if it is designated as environmentally hazardous by the Competent Authority of the country of origin, transit or destination.

335 - Mixtures of solids that are not subject to this subchapter and environmentally hazardous liquids or solids may be classified as "Environmentally hazardous substances, solid, n.o.s.," UN3077 and may be transported under this entry, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each transport unit must be leakproof when used as bulk packaging.

A112 - Notwithstanding the quantity limits shown in Column (9A) and (9B) for this entry, the following IBCs are authorized for transportation aboard passenger and cargo-only aircraft. Each IBC may not exceed a maximum net quantity of 1,000 kg:

a. Metal: 11A, 11B, 11N, 21A, 21B and 21N

b. Rigid plastics: 11H1, 11H2, 21H1 and 21H2

c. Composite with plastic inner receptacle: 11HZ1, 11HZ2, 21HZ1 and 21HZ2

d. Fiberboard: 11G

e. Wooden: 11C, 11D and 11F (with inner liners)

f. Flexible: 13H2, 13H3, 13H4, 13H5, 13L2, 13L3, 13L4, 13M1 and 13M2 (flexible IBCs must be sift-proof and water resistant or must be fitted with a sift-proof and water resistant liner).

B54 - Open-top, sift-proof rail cars are also authorized.

IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).

N20 - A 5M1 multi-wall paper bag is authorized if transported in a closed transport vehicle.

T1 - 1.5 178.274(d)(2) Normal..... 178.275(d)(2)

TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.

DOT Packaging Exceptions (49 CFR 173.xxx) : 155

DOT Packaging Non Bulk (49 CFR 173.xxx) : 213

DOT Packaging Bulk (49 CFR 173.xxx) : 240



Marine pollutant : P

14.3. Additional information

Other information : No supplementary information available.

State during transport (ADR-RID) : as solid.

Overland transport

Packing group (ADR) : III

Class (ADR) : 9 - Miscellaneous dangerous substances and articles

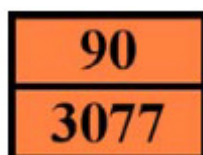
Hazard identification number (Kemler No.) : 90

Classification code (ADR) : M7



Danger labels (ADR) : 9 - Miscellaneous dangerous substances and articles

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according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations



Orange plates :
Tunnel restriction code : E
Transport by sea
DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
EmS-No. (1) : F-A
EmS-No. (2) : S-F
Air transport
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)
: No limit
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)
: No limit

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 depletors.

This material does not contain any Class 2 Ozone depletors.

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

The information contained within this document 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, expressed 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 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 M.C. Miller Co. Inc. has been advised of the possibility of such damages.