

# MATERIAL SAFETY DATA SHEET

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NO. 29

COPPER SULFATE  
Revision A

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## SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: COPPER SULFATE  
OTHER DESIGNATIONS: Cupric Sulfate Pentahydrate (CAS #007 758 998), Copper (II) Sulfate (CAS #007 758 987), Bluestone, Blue Vitriol, GE Material D4F13B,C.  
MANUFACTURER: Available from several suppliers, including:  
Mallinckrodt, Inc. Ashland Chem. Co.  
P.O. Box M P.O. Box 2219  
Paris, KY 40361 Columbus, OH 43216  
Tel: (606) 987-7000 Tel: (614) 889-3333

## SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
CuSO <sub>4</sub> ·5H <sub>2</sub> O (36.1% water)	ca 100	8-hr TWA 1.0 mg/m <sup>3</sup> (as Cu)*  Human, Oral TDLo 272 mg/kg Toxic effects  Rat, Oral LD <sub>50</sub> 300 mg/kg (as CuSO <sub>4</sub> )
*Current OSHA PEL and ACGIH (1984) TLV for copper dust and solution mist.		

## SECTION III. PHYSICAL DATA

Solubility in water, 0C, g/100g -----	31.6	Specific gravity (H <sub>2</sub> O=1) --	2.284
30C -----	24.3	Melting point, (-4H <sub>2</sub> O) deg C -	110
100C -----	203.3	pH (0.2 molar aq. soln) -----	4.0
		Molecular weight -----	249.7

Appearance & Odor: Transparent blue triclinic crystals or crystalline granules or powder. Odorless. Nauseous metallic taste (toxic).

## SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits in Air	Lower	Upper
N/A				

Extinguishing media: A nonflammable solid. Use suitable extinguishing media for surrounding fire. When heated above 110C material will melt and flow. Avoid using a direct water stream on molten material (causes splattering). Sealed containers may rupture during fire conditions from pressure of water vapor released from crystals.  
Firefighters should wear self-contained breathing apparatus.

## SECTION V. REACTIVITY DATA

This is a stable material in closed containers at room temperature under normal storage and handling conditions. It does not polymerize.  
Material is acidic when dissolved in water. The solution can react with magnesium metal to evolve flammable hydrogen gas.  
Loses water of hydration by slowly efflorescing in air or rapidly on heating (-2H<sub>2</sub>O at 30C, -4H<sub>2</sub>O at 110C, and -5H<sub>2</sub>O at 250C) to yield white, anhydrous cupric sulfate.  
Contact with this anhydrous salt will ignite hydroxylamine.  
At temperatures >400C, it decomposes to cupric oxide and sulfur oxide.

SECTION VI. HEALTH HAZARD INFORMATION	TLV 0.01 mg/m <sup>3</sup> (as Cu) mist or dust
<p>Copper Sulfate is toxic. Inhalation of dusts or solution mists of copper salts can cause ulceration of nasal septum and nasopharyngeal congestion of the mucous membranes. Repeated or prolonged skin contact may cause irritation and eczema. Particulate or solution in the eyes may cause conjunctivitis, ulceration or clouding of the cornea. Ingestion can cause severe G.I. tract irritation, abdominal pain, salivation, nausea, and hemorrhagic gastritis. It's unpleasant taste and prompt emetic effect upon ingestion can reduce oral toxicity. Ingestion of 10g (as CuSO<sub>4</sub>) has resulted in death.</p> <p><b>FIRST AID:</b></p> <p><u>Eye Contact:</u> Flush thoroughly with running water for 15 min. including under eyelids.  <u>Skin Contact:</u> Remove contaminated clothing. Flush affected area with plenty of water.  <u>Inhalation:</u> Remove to fresh air. Rinse mouth with water. Restore and/or support breathing as needed.  <u>Ingestion:</u> Give conscious victim 2 or 3 glasses of milk or water to drink. Induce vomiting. (Vomiting may occur spontaneously)</p> <p>Seek medical assistance for further treatment, observation and support after first aid.</p>	
SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES	
<p>Notify safety personnel of spills. Provide adequate ventilation. Clean-up personnel need protection against inhalation of dust or mist. Sweep up or vacuum, avoid dusting conditions, and place in appropriate container for reclamation or disposal. Absorb liquid spills on vermiculite or dry sand. Flush residue with much water.</p> <p><b>DISPOSAL:</b> Bury scrap in an approved landfill. Treatment with lime to precipitate insoluble basic copper salts may be desirable.</p> <p>Follow Federal, State and Local regulations.  EPA(CWA) RQ 10 lb. (Cupric Sulfate, CuSO<sub>4</sub>) 40CFR117</p>	
SECTION VIII. SPECIAL PROTECTION INFORMATION	
<p>Provide general and local exhaust ventilation as needed to meet TLV requirements. When dusty conditions prevail, use a high efficiency particulate filter respirator or a self-contained breathing apparatus; a full facepiece is required above the TLV. Wear body protective clothing appropriate for the work situation to minimize skin contact. Prevent eye contact by wearing chemical safety goggles where splashing is possible. Use rubber gloves to prevent repeated or prolonged skin contact. Soiled clothing to be laundered before reuse.</p> <p>Eyewash stations and washing facilities should be available to areas of use and handling.</p>	
SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS	
<p>Store in closed containers in a cool, dry, well-ventilated area away from sources of heat, and reducing agents. Use good housekeeping practices to prevent accumulation of dust. Avoid breathing dust or solution mist. Minimize skin contact by using proper gloves and apron and follow good personal hygiene. Do not ingest. Keep out of eyes.</p>	
DOT Classification: Cupric sulfate; ORM-E I.D. NA9109	
DATA SOURCE(S) CODE: 1-7,10,12,25,27,31,44,47-49	
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