

## MATERIAL SAFETY DATA SHEET

ISSUE DATE: 2/14/2011

### SECTION 1: PRODUCT IDENTIFICATION

**PRODUCT NAME:** Copper Sulfate  
**SYNONYMS:** Blue Vitrol, Bluestone, Cupric Sulfate  
**CAS NUMBER:** 7758-99-8  
**MOLECULAR FORMULA:** CuSO<sub>4</sub> 5H<sub>2</sub>O  
**EPA REG. NUMBER:** 46923-4  
**SIC NUMBER:** 28199 C 29

**REGION:** United States

### SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

**Exposure Limits:** ACGIH TLV TWA: 1.0 mg/m<sup>3</sup> (as copper dust/mist)  
OSHA PEL TWA: 1.0 mg/m<sup>3</sup> (as copper dust/mist)

### SECTION 3: HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

<b>Physical state:</b> Solid crystals	<b>HMIS:</b>	<b>NFPA:</b>
<b>Color:</b> Transparent blue	<b>Health:</b> 3	<b>Health:</b> 3
<b>Odor:</b> Odorless	<b>Fire:</b> 0	<b>Fire:</b> 0
	<b>Reactivity:</b> 0	<b>Reactivity:</b> 0

WARNING Can cause irreversible eye damage and severe skin irritation. Harmful if swallowed or absorbed through the skin. Avoid breathing dust or mist. Avoid contact with the skin, eyes or clothes. May cause skin sensitization in certain individuals.

<b>Swallowing:</b>	Toxic orally in accordance with FHSLA regulations. Acute oral LD <sub>50</sub> (male rats) = 472 mg/Kg. Can cause irritation to the digestive tract and abdominal pain.
<b>Skin:</b>	Slight skin irritant. Excessive exposure may cause skin irritation. Repeated exposure may cause allergic dermatitis. May cause irritation or burns on wet skin.
<b>Eyes:</b>	Can cause severe eye irritation and may result in irreversible eye damage.
<b>Inhalation:</b>	Inhalation of dust may cause irritation to the mucous membranes and upper respiratory tract. Carcinogenicity: None as per NTP, OSHA, and IARC.
<b>Carcinogenicity:</b>	None as per NTP, OSHA, and IARC.

See Section 11 for additional toxicological information.

### SECTION 4: FIRST AID MEASURES

<b>Ingestion:</b>	Give large amounts of milk, egg white, gelatin solution, or if they are not available, large quantities of water. Do not induce vomiting or give anything to an unconscious person. Avoid alcohol. Call Poison Control Center or a physician.
<b>Skin:</b>	Wash thoroughly with soap and water. Remove and wash contaminated clothing before reuse.
<b>Eyes:</b>	Immediately flush eyes with plenty of water for 15 minutes. Hold eyelids apart during irrigation. Call a physician.
<b>Inhalation:</b>	Remove person to fresh air. If not breathing, administer artificial respiration. Get medical attention.
<b>Carcinogenicity:</b>	None.

## SECTION 5: FIRE-FIGHTING MEASURES

<b>Flash point:</b>	Not applicable
<b>Flammable limits:</b>	Not flammable. If heated above 400 degrees C it can decompose to emit toxic fumes of oxide and sulfur
<b>Autoignition temperature:</b>	Not determined
<b>Extinguishing media:</b>	Copper sulfate does not burn nor will it support combustion. If stored with other combustible products use water, CO2 or dry chemical.
<b>Special firefighting procedures:</b>	If dry heated above 600o C, SO2 is evolved. If water is used it will solubalize the Copper Sulfate and care should be taken to keep such water out of streams or other water bodies.
<b>Fire Fighting Equipment:</b>	Wear self-contained breathing apparatus.
<b>Fire and Explosion Hazards:</b>	None.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

Use clean-up measures that avoid dust generation. Wear NIOSH or MSHA approved respirator if dust will be generated. Cover spill with absorbent material such as seeping compound or lime. Sweep up and put into an appropriate container for proper disposal in an approved method. Prevent accidental entry of solution into streams or other bodies of water. Shovel spills into plastic bags and seal with tape.

## SECTION 7: HANDLING AND STORAGE

<b>Signal Word:</b>	<b>Danger</b>
<b>Handling:</b>	Avoid breathing dust or mist. Sweep up crystals. Eye wash stations should be available in work areas. Users should wash hands before eating, drinking, smoking or using the toilet. Remove PPE immediately after handling this product. Wash outside of gloves before removing. Wash and change into clean clothing as soon as possible.
<b>Storage:</b>	Store in closed containers in a cool, dry, well ventilated area away from heat sources and reducing agents. Store in original containers. Keep away from galvanized pipe, aluminum and nylon. Place damaged containers in plastic bags.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

<b>Ventilation:</b>	TWA = 1 mg/l. for Copper Sulfate. When TWA exceeds this limit in the workplace, provide appropriate ventilation.
<b>Respiratory Protection:</b>	Wear an approved respirator for dusts or mists: MSHA/NIOSH approved number prefix TC-21C, or a NIOSH approved respirator with any R, P or HE filter. Alternatively, provide respiratory protection equipment in accordance with Paragraph 1910.134 of Title 29 of the Code of Federal Regulations.
<b>Eye Protection:</b>	Use safety glasses with side shields or goggles.
<b>Skin Protection:</b>	Applicators and other handlers should wear longsleeved shirts and long pants, waterproof gloves, shoes plus socks and protective eyewear. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with product's concentrate. Do not reuse them. Keep and wash PPE separately from other laundry.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b>	Solid crystals or powder
<b>Color:</b>	Transparent Blue
<b>Odor:</b>	Odorless
<b>Boiling point/range:</b>	-5H2O @ 150 degrees C
<b>Melting point/ range:</b>	-4H2O @ 110 degrees C
<b>Specific gravity:</b>	2.284
<b>Solubility in water:</b>	22.37% @ 0 degrees C 117.95% @ 100 degrees C
<b>Solubility in other solvents:</b>	Soluble in methanol, glycerol and slightly soluble in ethanol.
<b>Molecula weight:</b>	249.68

## SECTION 10: STABILITY AND REACTIVITY

<b>Stability:</b>	Stable
<b>Conditions to Avoid:</b>	Product is highly soluble, but does not react with water.
<b>Incompatibility:</b>	Solutions are mildly corrosive to steel. Store solutions in plastic or rubber or 304, 347 or 316 stainless steel. Iron and moisture should be avoided. Store in a dry area. Incompatible with aluminum powder, acetylene gas, hydroxylamine, magnesium and moisture. Contact with magnesium can generate dangerous levels of hydrogen gas. With exposure to air it will oxidize and turn whitish.
<b>Hazardous Decomposition Products:</b>	None at normal production temperatures and pressures. If dry heated above 600°C toxic sulfur may evolve.
<b>Polymerization:</b>	Will not occur.

## SECTION 11: TOXICOLOGICAL INFORMATION

<b>Inhalation:</b>	LC50 > 2.95 mg/L (rat) Inhalation of dust can result in irritation of nasal mucous membranes and sometimes of the pharynx, on occasion ulceration with perforation of the nasal septum.
<b>Skin:</b>	LD50 > 8.0 g/kg (rabbit)
<b>Ingestion:</b>	LD50 > 472.5 mg/kg (rat)
<b>Primary Eye Irritation:</b>	Corrosive, irreversible eye damage.
<b>Primary Skin Irritation:</b>	No skin irritation.
<b>Note to Physician:</b>	Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed. Wilson's disease can be aggravated by excessive exposure. Symptoms include nausea, vomiting, epigastric pain, diarrhea, dizziness, jaundice, and general debility.

## SECTION 12: ECOLOGICAL INFORMATION

<b>Aquatic LC50,:</b>	Daphnia magna 0.182 mg/L. Rainbow Trout 0.17 mg/L. Blue Gill 1.5 mg/L. All values are expressed as Copper Sulfate Pentahydrate. Test water was soft. Period 24 hours
<b>Spills and Leaks:</b>	Comply with Federal, State and local regulations on reporting spills. Do not wash away crystals or powder. Recover dry if possible. If product is in a confined solution, react with soda ash to form an insoluble Copper Carbonate solid that can be scooped up.
<b>Waste Disposal:</b>	Do not reuse container. Comply with Federal, State and local environmental control regulations. Sweep up crystals, powder or insoluble Copper Carbonate and dispose of in an approved landfill.
<b>Environmental Effects:</b>	May be dangerous if it enters the public water systems. Follow local regulation. Toxic to fish and plants. Fish toxicity critical concentration is 235 mg/l. and plant toxicity is 25 mg/l.

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**SECTION 13: REGULATORY INFORMATION**

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Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that its activities comply with Federal, State, and local laws.

<b>SARA 313 Information;</b>	This product contains the following substance subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372: COPPER COMPOUND > 1.0%
<b>SARA HAZARD CATEGORY:</b>	This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following category: <b>ACUTE HEALTH HAZARD</b>
<b>OSHA:</b>	This product is considered hazardous under the OSHA Hazardous Communication Standard (29 CFR 1910.1200).
<b>TSCA:</b>	Listed on the Chemical Inventory
<b>CERCLA Hazardous Substances:</b>	RQ is not assigned to the broad class of copper
<b>RCRA:</b>	When discarding this material as supplied, it does not meet RCRA characteristic definition if ignitability, corrosiveness, reactivity, and is not listed in 40CFR 261.33. This product contains Copper Sulfate and is subject to the reporting requirements of Section 13 of the Emergency Planning and Community-Right-to-Know-Act of 1986 (40 CFR 372).
<b>NSF:</b>	Maximum use in potable water applications per NSF formulation - 2 ppm

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**SECTION 14: TRANSPORT INFORMATION**

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DOT Shipping Name RQ, Environmentally Hazardous Substance, Solid, NOS, (CUPRIC SULFATE), 9, UN3077, PGIII, ERG 171  
Reportable Quantity (RQ): 10 pounds (4.54 kg) Not hazardous when shipping less than 10 pounds

**Note:** Marine pollutant

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**SECTION 15: MISCELLANEOUS INFORMATION**

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This is an NSF Certified Product to ANSI/NSF 60. Maximum use in potable water is not to exceed 2 mg. per liter.

**"The information herein is given in good faith, but no warranty, express or implied, is made."**