

**Safety Data Sheet**

**1. IDENTIFICATION**

**Product Identifier:** VMS Copper Sulfate Solution

**Product Code(s):** CF1052, CF1188

**Synonyms:** Cupric Sulfate – Sulfuric Acid Solution

**Recommended Use:** For manufacturing, industrial, and laboratory use only. Use as a solvent or as a laboratory reagent.

**Uses Advised Against:** Not for food, drug, or household use.

**Supplier:** Rocky Mountain Reagents, Inc.  
4621 Technology Drive, Golden, CO 80403  
Phone: (303) 762-0800 Fax: (303) 762-1240

**Emergency Phone Number:** (800) 255-3924 (CHEM-TEL)

**2. HAZARDS IDENTIFICATION**

**Hazard Classifications:**

Acute Toxicity – Inhalation:	Category 3
Skin Corrosion/Irritation:	Category 1A
Eye Damage/Irritation:	Category 1

**Signal Word:** DANGER

**Hazard Statements:** Toxic if inhaled.  
Causes severe skin burns and serious eye damage.

**Pictograms:**



**Precautionary Statements:**

**Prevention:** Do not breathe fumes, mists, vapors, or spray.  
Use only outdoors or in a well-ventilated area.  
Wash thoroughly after handling.  
Wear protective gloves, protective clothing, eye protection, and face protection.

**Response:** Immediately call a poison center or doctor.  
If inhaled: Remove person to fresh air and keep comfortable for breathing.  
If swallowed: Rinse mouth. Do NOT induce vomiting.  
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water.  
Wash contaminated clothing before reuse.  
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**Storage:** Store in a well-ventilated place. Keep container tightly closed.  
Store locked up.

**Disposal:** Dispose of contents and container in accordance with local, regional, national, and international regulations.

**Hazards Not Otherwise Classified:** Toxic to aquatic life. Avoid release to the environment.  
Inhalation of inorganic mists containing sulfuric acid may cause cancer.

**Toxicity Statement:** Not applicable.

### 3. COMPOSITION AND INFORMATION ON INGREDIENTS

Component	Common Name / Synonyms	CAS#	Chemical Formula	% by Weight
Water	Water	7732-18-5	H <sub>2</sub> O	70.3 – 79.3
Sulfuric Acid	Hydrogen Sulfate	7664-93-9	H <sub>2</sub> SO <sub>4</sub>	18.1 – 23.2
Cupric Sulfate, Pentahydrate	Copper Sulfate, Pentahydrate	7758-99-8	CuSO <sub>4</sub> • 5H <sub>2</sub> O	2.58 – 6.47

**Trade Secret Statement:** Not applicable.

### 4. FIRST AID MEASURES

#### First Aid Procedures:

**Inhalation:** Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious, or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately.

**Ingestion:** Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, keep head low so that vomit does not enter lungs. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Get medical attention immediately.

**Skin Contact:** Wash skin with soap and plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention immediately.

**Eye Contact:** Check for and remove contact lenses, if present and easy to do. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Immediate medical attention is required. Get medical attention immediately.

**General Advice:** Poison information centers in each state can provide additional assistance for scheduled poisons. Ensure that those providing first aid and medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**Symptoms and Effects:** Irritation, burning, ulceration, coughing, sneezing, choking sensation, hoarseness, dyspnea, bronchitis, gastric infection, nausea, vomiting, diarrhea, thirst, difficulty swallowing, salivation, chills, fever, shock, weak and rapid pulse, metal fume fever, dizziness, headache, abdominal pain. Corrosive. Harmful if swallowed, inhaled, or absorbed through the skin. Causes irritation and burns to the eyes, skin, respiratory tract, and gastrointestinal tract. May enter lungs if swallowed or vomited. May cause tissue damage. May cause skin discoloration. Prolonged or repeated exposure may affect the liver, respiratory system, kidneys, and central nervous system; may cause tooth decay, dermatitis, conjunctivitis, reproductive effects, mutagenic effects, allergic reactions, and cancer.

**Immediate Medical Care/  
Special Treatment:** Immediate medical attention is required. Call a physician or poison control center immediately. Treat symptomatically.

## 5. FIREFIGHTING MEASURES

**Suitable Extinguishing Media:** Dry powder, alcohol resistant foam, carbon dioxide.

**Unsuitable Extinguishing Media:** Avoid using water.

**Hazardous Combustion  
Products:** Sulfur oxides, cupric oxides.

**Specific Hazards:** Excessive thermal conditions may cause decomposition and yield corrosive and/or toxic fumes. Contact with metals may produce hydrogen gas. Contact with water may cause violent exothermic reaction.

**Special Protective Equipment/  
Precautions for Firefighters:** As in any fire, wear MSHA/NIOSH-approved (or equivalent), self-contained, positive-pressure or pressure-demand breathing apparatus and full protective gear.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions and  
Protective Equipment:** Ventilate area of leak or spill. Isolate hazard area and keep unnecessary and unprotected personnel away from the area of the leak or spill. Keep upwind. Wear appropriate personal protective equipment (see Section 8). Avoid contact with eyes, skin, and clothing.

**Emergency Procedures:** In case of chemical emergency, or if unsure how to address an accidental release, consult a professional (see Section 1).

**Methods for Containment:** Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements, or confined areas. Dike the spilled material, where this is possible. Product should not be released to the environment. Contain and recover liquid when possible.

**Methods for Cleanup:** Absorb spill with an inert material (e.g. vermiculite, dry sand, earth, cloth, or fleece) and place in a non-combustible container for reclamation or disposal. Do not flush to sewer. Clean contaminated surface thoroughly. Residues from spills can be diluted with water and neutralized with a dilute alkaline material such as soda ash or lime. Never return spills in original containers for reuse. Clean up in accordance with all applicable regulations.

## 7. HANDLING AND STORAGE

**Handling:** Wear personal protective equipment (see Section 8). Use only in well-ventilated areas. Provide sufficient air exchange and/or exhaust in work rooms. Avoid contact with skin, eyes, and clothing. Do not breathe vapors or spray mist. Do not ingest. When using, do not eat, drink, or smoke. Keep away from incompatible materials (see Section 10). Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling. Containers of this material may be hazardous when empty, as they retain product

residues. Observe all warnings and precautions listed for this product. Do not add water directly to product. Instead, add product to water to prevent violent eruption of solution.

**Storage:**

Store in a cool, dry, ventilated area. Store in a segregated and approved area away from heat and incompatible materials (see Section 10). Store in original container. Do not store in metallic containers. Keep containers tightly closed and upright. Keep away from food, drink, and animal foodstuffs. Keep out of the reach of children. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of this product.

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Exposure Limits:**

Water:	No information found.	
Sulfuric Acid:	OSHA (PEL):	1 mg/m <sup>3</sup>
	ACGIH (TLV):	0.2 mg/m <sup>3</sup>
Copper:	ACGIH (TLV):	1 mg/m <sup>3</sup>

**Engineering Controls:**

Ensure adequate ventilation. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

**Personal Protective Measures:**

**Eye/Face Protection:**

Wear safety glasses with side shields or goggles and a face shield. Maintain approved eye wash station and accessible rinse facilities in work area.

**Skin Protection:**

Wear appropriate chemical resistant clothing (with long sleeves) and appropriate chemical resistant gloves.

**Respiratory Protection:**

An air-purifying, NIOSH-approved respirator with appropriate cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Use a full-face, positive-pressure, air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are unknown, or if any other circumstances exist where air-purifying respirators may not provide adequate protection.

**Specific Requirements for Personal Protective Equipment:**

Ensure that glove material is compatible with this product. This information is available from glove manufacturers.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:**

Blue, transparent liquid.

**Odor:**

Very slight.

**Odor Threshold:**

No information found.

**Formula Weight:**

Mixture

**pH:**

< 4

**Melting/Freezing Point:**

No information found.

**Boiling Point/Range:**

No information found.

**Decomposition Temperature:**

No information found.

**Flash Point:**

Not applicable.

<b>Auto-ignition Temperature:</b>	Not applicable.
<b>Flammability:</b>	Not flammable.
<b>Flammability/Explosive Limits:</b>	Not applicable.
<b>Solubility:</b>	Miscible with water.
<b>Vapor Pressure:</b>	No information found.
<b>Vapor Density (Relative):</b>	No information found.
<b>Specific Gravity:</b>	1.160 – 1.164 (Water = 1)
<b>Evaporation Rate:</b>	No information found.
<b>Viscosity:</b>	No information found.
<b>Partition Coefficient (n-octanol/water):</b>	No information found.

## 10. STABILITY AND REACTIVITY

<b>Reactivity Data:</b>	Corrosive. See Section 11.
<b>Chemical Stability:</b>	Stable under normal conditions. Sensitive to moisture.
<b>Conditions to Avoid:</b>	Excessive heat, moisture, incompatible materials.
<b>Incompatible Materials:</b>	Water, strong bases, strong acids, organic compounds, combustible materials, metals, oxidizers.
<b>Hazardous Decomposition Products:</b>	Hydrogen, sulfur oxides, cupric oxides.
<b>Possibility of Hazardous Reactions:</b>	May react vigorously, violently, or explosively with the incompatible materials listed above. Excess thermal conditions may yield corrosive and/or toxic fumes. Contact with metals may produce hazardous concentrations of hydrogen gas. Contact with water or strong bases may cause violent exothermic reaction.
<b>Hazardous Polymerization:</b>	Will not occur.

## 11. TOXICOLOGICAL INFORMATION

<b>Routes of Exposure:</b>	Inhalation, ingestion, skin contact, eye contact.		
<b>Acute Effects:</b>	Corrosive. Toxic if inhaled. Harmful if swallowed or absorbed through the skin. Causes irritation and burns to the eyes, skin, respiratory tract, and gastrointestinal tract. May enter lungs if swallowed or vomited. May cause tissue damage. May cause skin discoloration.		
<b>Chronic Effects:</b>	Prolonged or repeated exposure may affect the liver, respiratory system, kidneys, and central nervous system; may cause tooth decay, dermatitis, conjunctivitis, reproductive effects, mutagenic effects, allergic reactions, and cancer.		
<b>Toxicological Data:</b>	Water:	Not applicable.	
	Sulfuric Acid:	LD <sub>50</sub> Oral, Rat:	2140 mg/kg
		LC <sub>50</sub> Inhalation, Rat:	0.510 mg/L 2 h
		Corrosive to skin and eyes based on animal data.	

Cupric Sulfate, Pentahydrate: LD<sub>50</sub> Oral, Rat: 300 mg/kg  
LD<sub>50</sub> Dermal, Rabbit: > 2000 mg/kg

**Symptoms of Exposure:** Irritation, burning, ulceration, coughing, sneezing, choking sensation, hoarseness, dyspnea, bronchitis, gastric infection, nausea, vomiting, diarrhea, thirst, difficulty swallowing, salivation, chills, fever, shock, weak and rapid pulse, metal fume fever, dizziness, headache, abdominal pain.

**Carcinogenic Effects:** This product may cause cancer.

**ACGIH:** Sulfuric Acid: A2 – Suspected human carcinogen

**IARC:** Sulfuric Acid: 1 – Carcinogenic to humans

## 12. ECOLOGICAL INFORMATION

**Ecotoxicological Data:** Water:  
No information found.

Sulfuric Acid:  
LC<sub>50</sub>, Western Mosquitofish (*Gambusia affinis*): 42 mg/L 96 h  
EC<sub>50</sub>, Water Flea (*Daphnia magna*): 29 mg/L 24 h

Cupric Sulfate, Pentahydrate:  
LC<sub>50</sub>, Rainbow Trout (*Oncorhynchus mykiss*): 3200 mg/L 120 h  
EC<sub>50</sub>, Water Flea (*Daphnia magna*): 0.024 mg/L 48 h

**Persistence and Degradability:** Some components of this product may bioaccumulate and may not be readily biodegradable.

**Environmental Effects:** Very toxic to aquatic life. May leach into groundwater. Avoid exposure to the environment.

## 13. DISPOSAL INFORMATION

**Disposal Instructions:** Dispose of this material and its container to hazardous or special waste collection point. Minimize exposure to product waste (see Section 8). Do not dispose unused waste down drains or into sewers. All wastes must be handled in accordance with local, state, and federal regulations.

**Contaminated Packaging:** Because emptied containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

**Waste Codes:** D002: Waste Corrosive Material (pH ≤ 2 or pH ≥ 12.5 or corrosive to steel)

## 14. TRANSPORT INFORMATION

**DOT:**

**UN Number:** UN3264

**Proper Shipping Name:** Corrosive liquids, acidic, inorganic, n.o.s. (Sulfuric acid, Copper sulfate)

**Hazard Class:** 8

**Packing Group:** II

ERG Number: 154

Environmental Hazard Regulations: Cupric Sulfate: IMDG Marine Pollutant

Other Transport Precautions: No information found.

## 15. REGULATORY INFORMATION

### U.S. Federal Regulations:

**OSHA:** This product is considered a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**TSCA Inventory:** All components of this product are on the U.S. TSCA Inventory.

### U.S. EPCRA (SARA Title III):

**Section 302:** Sulfuric Acid: Reportable Quantity: 1000 lb  
Threshold Planning Quantity: 1000 lb

### Sections 311/312:

Hazard Category	List (Yes/No)
Section 311 – Hazardous Chemical	Yes
Immediate Hazard	Yes
Delayed Hazard	Yes
Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	Yes

**Section 313:** Sulfuric Acid: 1.0 %

**CERCLA Reportable Quantities:** Sulfuric Acid: 1000 lb  
Cupric Sulfate, Anhydrous: 10 lb

### International Inventories:

Country or Region	Inventory Name	On Inventory (Yes/No)*
Australia	Australian Inventory of Chemical Substances (AICS)	N/A
Canada	Domestic Substances List (DSL)	N/A
Canada	Non-Domestic Substances List (NDSL)	N/A
China	Inventory of Existing Chemical Substances in China (IECSC)	N/A
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	N/A
Europe	European List of Notified Chemical Substances (ELINCS)	N/A
Japan	Inventory of Existing and New Chemical Substances (ENCS)	N/A
Korea	Existing Chemicals List (ECL)	N/A
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	N/A

\*A "Yes" indicates that the listed component(s) of this product comply with the inventory requirements administered by the governing country(s).

## 16. OTHER INFORMATION

**Disclaimer:** Rocky Mountain Reagents, Inc. provides the information in this Safety Data Sheet in the belief that it is reliable but assumes no responsibility for its completeness or accuracy. The physical properties reported in this SDS are obtained from literature and do not constitute product specifications. Rocky Mountain Reagents, Inc. makes and gives no representations or warranties with respect to the information contained herein or the product to which it refers, whether express, implied, or statutory, including without limitation, warranties of accuracy, completeness, merchantability, non-infringement, performance, safety, suitability, stability, and fitness for a particular purpose. No warranty against infringement of any patent, copyright or trademark is made or implied. This SDS is intended only as a guide to the appropriate handling of the material by a properly trained person. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. Accordingly, Rocky Mountain Reagents, Inc. assumes no liability whatsoever for the use of or reliance upon this information including results obtained, incidental or consequential damages, or lost profits.

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**Reason for Revision:** Not applicable.