

COPPER SULFATE, AMMONIATED

CSN

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Ammonium cupric sulfate Copper ammonium sulfate Cuprammonium sulfate Cupric ammine sulfate Tetraammine copper sulfate	Solid Dark blue Ammonia odor
Sinks and mixes with water.	
Notify local health and pollution control agencies. Avoid inhalation.	
Fire	Fire data not available.
Exposure	CALL FOR MEDICAL AID. SOLID Harmful if swallowed. Irritating to skin and eyes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and induce vomiting.
Water Pollution	Effects of low concentrations on aquatic life are unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse dissolved material
Stop discharge
Contain undissolved material
Collection Systems: Dredge
Cover with organic sulfur containing compounds

2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** Not listed.
2.2 **Formula:** $\text{CuSO}_4 \cdot 4\text{NH}_3 \cdot \text{H}_2\text{O}$
2.3 **IMO/UN Designation:** Not listed
2.4 **DOT ID No.:** 9110
2.5 **CAS Registry No.:** 10380-29-7
2.6 **NAERG Guide No.:** 171
2.7 **Standard Industrial Trade Classification:** 52349

3. HEALTH HAZARDS

3.1 **Personal Protective Equipment:** Currently not available
3.2 **Symptoms Following Exposure:** INHALATION: Inhalation of dust may produce severe irritation of upper respiratory tract. Congestion of the nasal mucosa. EYES: May cause conjunctivitis and edema of eyelids. SKIN: May cause irritation. INGESTION: May induce severe gastroenteric distress: vomiting, pain, local corrosion, and hemorrhages.
3.3 **Treatment of Exposure:** Call a physician. EYES: Flush with water. SKIN: Wash with water. INGESTION: Induce vomiting and administer gastric lavage. Give saline cathartic.
3.4 **TLV-TWA:** Notice of intended change: 0.05 mg Cu/m³ respirable particles
3.5 **TLV-STEL:** Not listed.
3.6 **TLV-Ceiling:** Not listed.
3.7 **Toxicity by Ingestion:** Currently not available
3.8 **Toxicity by Inhalation:** Currently not available.
3.9 **Chronic Toxicity:** Copper poisoning in animals leads to injury of liver, kidneys, and spleen.
3.10 **Vapor (Gas) Irritant Characteristics:** Not pertinent
3.11 **Liquid or Solid Characteristics:** Currently not available
3.12 **Odor Threshold:** Currently not available
3.13 **IDLH Value:** 100 mg Cu/m³ (dust, mist, fumes)
3.14 **OSHA PEL-TWA:** 0.1 mg/m³ as copper
3.15 **OSHA PEL-STEL:** Not listed.
3.16 **OSHA PEL-Ceiling:** Not listed.
3.17 **EPA AEGL:** Not listed

4. FIRE HAZARDS

4.1 **Flash Point:** Currently not available
4.2 **Flammable Limits in Air:** Currently not available
4.3 **Fire Extinguishing Agents:** Currently not available
4.4 **Fire Extinguishing Agents Not to Be Used:** Currently not available
4.5 **Special Hazards of Combustion Products:** Gives off ammonia when heated to 120°C.
4.6 **Behavior in Fire:** Currently not available
4.7 **Auto Ignition Temperature:** Currently not available
4.8 **Electrical Hazards:** Currently not available
4.9 **Burning Rate:** Currently not available
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent
4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

5.1 **Reactivity with Water:** May release ammonia while present in water.
5.2 **Reactivity with Common Materials:** Currently not available
5.3 **Stability During Transport:** Currently not available
5.4 **Neutralizing Agents for Acids and Caustics:** Currently not available
5.5 **Polymerization:** Currently not available
5.6 **Inhibitor of Polymerization:** Currently not available

6. WATER POLLUTION

6.1 **Aquatic Toxicity:** Currently not available
6.2 **Waterfowl Toxicity:** Currently not available
6.3 **Biological Oxygen Demand (BOD):** Currently not available
6.4 **Food Chain Concentration Potential:** Currently not available
6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

7.1 **Grades of Purity:** Currently not available
7.2 **Storage Temperature:** Currently not available
7.3 **Inert Atmosphere:** Currently not available
7.4 **Venting:** Currently not available
7.5 **IMO Pollution Category:** Currently not available
7.6 **Ship Type:** Currently not available
7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

8.1 **49 CFR Category:** Not listed
8.2 **49 CFR Class:** Not pertinent
8.3 **49 CFR Package Group:** Not listed.
8.4 **Marine Pollutant:** No
8.5 **NFPA Hazard Classification:** Not listed
8.6 **EPA Reportable Quantity:** 100 pounds
8.7 **EPA Pollution Category:** B
8.8 **RCRA Waste Number:** Not listed
8.9 **EPA FWPCA List:** Yes

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 **Physical State at 15° C and 1 atm:** Solid
9.2 **Molecular Weight:** 227.73 (anhydrous); 245.8 (monohydrate)
9.3 **Boiling Point at 1 atm:** Hydrate loses H₂O and 2NH₃ at 120°C and remaining 2NH₃ at 160°C. Decomposes at 150°C.
9.4 **Freezing Point:** Not pertinent
9.5 **Critical Temperature:** Currently not available
9.6 **Critical Pressure:** Currently not available
9.7 **Specific Gravity:** 1.81 at 20°C; 1.79 at 25°C
9.8 **Liquid Surface Tension:** Currently not available
9.9 **Liquid Water Interfacial Tension:** Currently not available
9.10 **Vapor (Gas) Specific Gravity:** Currently not available
9.11 **Ratio of Specific Heats of Vapor (Gas):** Currently not available
9.12 **Latent Heat of Vaporization:** Currently not available
9.13 **Heat of Combustion:** Currently not available
9.14 **Heat of Decomposition:** Currently not available
9.15 **Heat of Solution:** Currently not available
9.16 **Heat of Polymerization:** Currently not available
9.17 **Heat of Fusion:** Currently not available
9.18 **Limiting Value:** Currently not available
9.19 **Reid Vapor Pressure:** Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
	N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
18	70.700		N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T