SAFETY DATA SHEET

1. Identification

Product Name Copper(II) sulfate

Cat No. : AC422870000; AC422870025; AC422870050; AC422870100; AC422871000; AC422875000

CAS No 7758-98-7
Synonyms Cupric sulfate anhydrous; Cupric sulfate; Copper monosulfate

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute oral toxicity Category 4 Skin Corrosion/Irritation Category 2 Serious Eye Damage/Eye Irritation Category 2

Label Elements

Signal Word
Warning

Hazard Statements
Harmful if swallowed
Causes skin irritation

Causes serious eye irritation

Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Wear protective gloves/protective clothing/eye protection/face protection
Skin
IF ON SKIN: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. ContinuerinsingIf eye irritation persists: Get medical advice/attention

Ingestion

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Very toxic to aquatic life with long lasting effects

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Cupric sulfate	7758-98-7	98

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Getmedical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attentionif symptoms occur.

Inhalation Remove to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaledthesubstance; give artificial respiration with the aid of a pocket mask equipped withaone-way valve or other proper respiratory medical device. Get medical attention. If not breathing, give artificial respiration.

Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately. No information available.

Most important symptoms and effects

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Substance is nonflammable; use agent most appropriate to extinguish surroundingfire. **Unsuitable**

Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature No information available
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Donotallow run-off from fire-fighting to enter drains or water courses.

Hazardous Combustion Products
Toxic fumes. Sulfur oxides. Copper oxides.

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

NFPA

Health	Flammability	Instability	Physical hazards
2	0	1	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment as required. Ensure adequate ventilation. Avoiddust formation. Avoid contact with skin, eyes or clothing.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material tocontaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. Should not be releasedinto the environment.

Methods for Containment and Clean Up Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

7. Handling and storage

Handling Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoiddust formation. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation.

Storage. Keep containers tightly closed in a dry, cool and well-ventilated place. Store under aninertatmosphere. Incompatible Materials. Strong bases. Metals. Alkali metals. Finelypowdered metals.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Cupric sulfate	TWA: 1 mg/m^3		IDLH: 100 mg/m^3 TWA: 1 mg/m^3	

Legend

ACGIH *- American Conference of Governmental Industrial Hygienists*
NIOSH IDLH: *NIOSH - National Institute for Occupational Safety and Health*

Engineering Measures Ensure adequate ventilation, especially in confined areas. Ensure that eyewashstationsand safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as describedbyOSHA's eye and face protection regulations in 29 CFR 1910.133 or EuropeanStandard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or EuropeanStandardEN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Handle in accordance with good industrial hygiene and safety practice.

Hygiene Measures

9. Physical and chemical properties

Physical State Powder Solid
Appearance Grey
Odor Odorless
Odor Threshold No information available **pH** 3.5-4.5
Melting Point/Range 200 °C / 392 °F **Boiling Point/Range** No information available **Flash Point** No information available **Evaporation Rate** Not applicable **Flammability (solid,gas)** No information available **Flammability or explosive limits**
Upper No data available
Lower No data available
Vapor Pressure No information available **Vapor Density** Not applicable **Specific Gravity** 3.6
Solubility 203 g/L (20°C)
Partition coefficient; n-octanol/water No data available **Autoignition Temperature** No information available
Decomposition Temperature No information available **Viscosity** Not applicable **Molecular Formula** Cu O4 S
Molecular Weight 159.6

10. Stability and reactivity

Reactive Hazard None known, based on information available **Stability** Stable under normal conditions.

Hygroscopic.

Conditions to Avoid Avoid dust formation. Incompatible products. Excess heat. Exposure to moisture. **Incompatible Materials**

Strong bases, Metals, Alkali metals, Finely powdered metals **Hazardous Decomposition Products** Toxic fumes, Sulfur oxides,

Copper oxides

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Cupric sulfate	LD50 = 481 mg/kg (Rat)	LD50 > 1000 mg/kg (Rabbit)	Not listed

No information available

Toxicologically Synergistic Products

Delayed and immediate effects as well as chronic effects from short and long-term exposure **Irritation** Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as acarcinogen.

Component	CAS No	IARC	NT	ACGIH	OS	Mexi
Cupric sulfate	7758-98-7	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known
STOT - repeated exposure None known

Aspiration hazard No information available

No information available

Symptoms / effects,both acute and delayed

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not allowmaterial tocontaminate ground water system. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Cupric sulfate	Not listed	LC50: = 0.1 mg/L, 96h (Oncorhynchus mykiss)	Not listed	EC50 = 0.024 mg/L/48h

Persistence and Degradability May persist based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classifiedasahazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT
- **UN-No** UN3077
- **Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.
- **Technical Name** Cupric sulfate
- **Hazard Class** 9
- **Packing Group** III

TDG
- **UN-No** UN3077
- **Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.
- **Hazard Class** 9
- **Packing Group** III

IATA
- **UN-No** UN3077
- **Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.
- **Hazard Class** 9
- **Packing Group** III

IMDG/IMO
- **UN-No** UN3077
- **Proper Shipping Name** Environmentally hazardous substances, solid, n.o.s.
- **Hazard Class** 9
- **Packing Group** III

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA RegulatoryFlags
Cupric sulfate	7758-98-7	X	ACTIVE	-

Legend:
TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea(KECL).

Component	CAS No		DSL	NDSL	EINEC	P	E		AIC	IECSCKEC

Cupric sulfate	7758-98-7		X	231-847-						XKE-08956

KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

U.S. Federal Regulations

SARA 313

Component	CAS No	Weight %	SARA 313 - Threshold Values %
Cupric sulfate	7758-98-7	98	1.0

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Cupric sul	X	10 lb	X	-

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardoussubstance under the Comprehensive Environmental Response CompensationandLiability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Cupric sulfate	10 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Cupric	X	X	X	-	-

U.S. Department of Transportation
Reportable Quantity (RQ): Y
DOT Marine Pollutant N

DOT Severe Marine Pollutant Y

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Component	REACH (1907/2006) - Annex XIV -Substances Subject to Authorization	REACH (1907/2006) - Annex XVII -Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Cupric sulfate	-	Use restricted. See item 75. (see link for restriction details)	-

https://echa.europa.eu/substances-restricted-under-reach

Safety, health and environmental regulations/legislation specific for the substance or mixture

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone DepletionPotential	Restriction of Hazardous Substances (RoHS)
Cupric sulfate	7758-98-7	Listed	Not applicable	Not applicable	Not applicable

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantitiesfor Major AccidentNotification	Seveso III Directive(2012/18/EC) - Qualifying Quantitiesfor Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention(Hazardous Waste)
Cupric sulfate	7758-98-7	Not applicable	Not applicable	Not applicable	Annex I - Y22