Safety Data Sheet
Material Name: Copper Sulfate Pentahydrate

**Section 1 - Identification**

Chemical Name: Copper Sulfate Pentahydrate
Product Use: Specific applications are listed on the label for the product

**RESTRICTIONS on USE**

SPECIFIC RESTRICTIONS ARE LISTED ON THE LABEL FOR THE PRODUCT

Supplier Information
Chem One Ltd.
14140 Westfair East Drive
Houston, Texas 77041-1104

Phone: (713) 896-9966
Fax: (713) 896-7540

Emergency # (800) 424-9300 or +1-(703) 527-3887

General Comments
NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

**Section 2 – Hazard(s) Identification**

**GHS HAZARD**

**Hazard Classes**
Eye damage/irritation
Acute toxicity, oral
Acute aquatic toxicity
Chronic aquatic toxicity

**Hazard Categories**
Category 1
Category 4
Category 1
Category 1

**Signal Word:** Danger

**Pictograms:**

**Hazard Statements**

**PHYSICAL HAZARDS:**
None

**HEALTH HAZARDS:**
H302: Harmful if swallowed
H318: Causes serious eye damage

**ENVIRONMENTAL HAZARDS:**
H410: Very toxic to aquatic life with long lasting effects

**PRECAUTIONARY STATEMENTS:**
P102: Keep out of reach of children
P202: Do not handle until all safety precautions have been read and understood
P264: Wash hands thoroughly after handling
P270: Do not eat, drink or smoke when using this product
P273: Avoid release to the environment
P280: Wear protective gloves, clothing and eye protection

**RESPONSE STATEMENTS:**
P301+P312+P330: IF SWALLOWED: Call a POISON CENTER /doctor if
you feel unwell (USA National POISON CENTER 800-222-1222). Rinse mouth.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER/doctor ((USA National POISON CENTER 800-222-1222))
P391: Collect spillage

STORAGE STATEMENTS:
None

DISPOSAL STATEMENTS:
P501: Dispose of content and/or container in accordance with local, regional, national or international regulations

HAZARDS NOT OTHERWISE CLASSIFIED
No data available

* * * Section 3 – Composition/information on Ingredients * * *

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7758-99-8</td>
<td>Copper (II) Sulfate Pentahydrate</td>
<td>&gt; 99</td>
</tr>
</tbody>
</table>

Synonyms: Copper Sulfate Crystals, Blue Copper, Blue Stone, Blue Vitriol, Copper (II) sulfate, Cupric Sulfate, Copper Sulfate Fine 200, Fine 100, Fine 30, 20, 25, Small, Medium, Large, FCC IV, and Very High Purity

* * * Section 4 - First Aid Measures * * *

Potential Health Effects: Eyes
Causes serious eye damage. Signs/symptoms may include cloudy appearance of the cornea, chemical burns, severe pain, tearing, ulcerations, significantly impaired vision or complete loss of vision.

First Aid: Eyes
Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.

Potential Health Effects: Skin
This product may cause irritation of the skin with pain, itching and redness. Severe overexposure can cause skin burns. Prolonged exposure may cause dermatitis and eczema.

First Aid: Skin
Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

Potential Health Effects: Ingestion
Harmful or fatal if swallowed. May cause gastrointestinal irritation with symptoms such as nausea, vomiting, and diarrhea. Ingestion may cause degeneration of liver, kidney, or renal failure. Persons who survive ingestion may develop granulomatous lesions of the kidney. Ingestion of large amounts may lead to convulsions, coma or death.

First Aid: Ingestion
DO NOT INDUCE VOMITING. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

Potential Health Effects: Inhalation
May irritate the nose, throat and respiratory tract. Symptoms can include sore throat, coughing and shortness of breath. In severe cases, ulceration and perforation of the nasal septum can occur. If this material is heated, inhalation of fumes may lead to development of metal fume fever. This is a flu-like illness with symptoms of metallic taste, fever and chills, aches, chest tightness and cough. Repeated inhalation exposure can cause shrinking of the lining of the inner nose.
First Aid: Inhalation
Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method 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. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Notes to Physician
Provide general supportive measures and treat symptomatically. Basic Treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by non-rebreather mask at 10 to 15 L/minutes. Monitor for shock and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 mL/kg up to 200 mL of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal. Advanced Treatment: Consider orotracheal or nontracheal intubation for airway control in the patient who is unconscious. Start an IV with lactated Ringer's SRP: "To keep open", minimal flow rate. Watch for signs of fluid overload. For hypotension with signs of hypovolemia, administer fluid cautiously. Consider vasopressors if hypotensive with a normal fluid volume. Watch for signs of fluid overload. Use proparacaine, hydrochloride to assist eye irrigation.

** Section 5 - Fire Fighting Measures **

General Fire Hazards
Copper Sulfate Pentahydrate is not combustible, but may decompose in the heat of a fire to produce corrosive and/or toxic fumes.

Hazardous Combustion Products
Sulfur oxides and copper fumes.

Extinguishing Media
Copper Sulfate Pentahydrate is not flammable. Use extinguishing media suitable for surrounding fire.

Fire Fighting Equipment/Instructions
Firefighters should wear full protective clothing including self-contained breathing apparatus. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0 Other: Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

** Section 6 - Accidental Release Measures **

Containment Procedures
Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

Clean-Up Procedures
Wear appropriate protective equipment and clothing during clean-up. Shovel the material into waste container. Thoroughly wash the area after a spill or leak clean-up. Prevent spill reinstatement from contamination of storm drains, sewers, soil or groundwater.

Evacuation Procedures
Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials which can burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

Special Procedures
Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

** Section 7 - Handling and Storage **

Handling Procedures
It is a violation of Federal Law to use this product in a manner inconsistent with its labeling, when used as a pesticide. Do not breathe
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ID: C1-121A

dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.

Storage Procedures

Keep in original container in locked storage area. Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of fire-resistant materials. Post warning and “NO SMOKING” signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers). Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Do not cut, grind, weld, or drill near this container. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Do not store this material in open or unlabeled containers. Limit quantity of material stored. Store in suitable containers that are corrosion-resistant.

**Section 8 - Exposure Controls / Personal Protection**

Exposure Guidelines

A: General Product Information
Follow the applicable exposure limits.

B: Component Exposure Limits
The exposure limits given are for Copper & Inorganic Compounds, as Cu (7440-50-8), Copper fume as Cu or Copper dusts and mists, as Cu.

- ACGIH: 1 mg/m³ TWA (dusts & mists)
- OSHA: 1 mg/m³ TWA (dusts & mists)
- NIOSH: 1 mg/m³ TWA (dusts & mists)
- DFG MAKs: 1 mg/m³ TWA Peak, 2•MAK, 15 minutes; average value, 1-hr interval (copper and inorganic copper compounds)
- 0.1 mg/m³ TWA Peak, 2•MAK, 15 minutes, average value, 1-hr interval (fume)

Component Related Regulatory Information
This product may be regulated, have exposure limits or other information identified as the following: Copper (7440-50-8) and inorganic compounds, as Cu, Copper (7440-50-8) dusts and mists, as Cu and Copper fume, Cu.

Engineering Controls
Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement. Provide dust collectors with explosion vents.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face
Wear safety glasses with side shields (or goggles) and a face shield, if this material is made into solution. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin
Wear chemically-impervious gloves, made of any waterproof material, boots and coveralls to avoid skin contact. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory
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If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full-facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA’s Respiratory Protection Standard (1910.134-1998). The following NIOSH Guidelines for Copper dust and mists (as Cu) are presented for further information.

- Up to 5 mg/m³: Dust and mist respirator.
- Up to 10 mg/m³: Any dust and mist respirator except single-use and quarter mask respirators or any SAR.
- Up to 25 mg/m³: SAR operated in a continuous-flow mode or powered air-purifying respirator with a dust and mist filter(s).
- Up to 50 mg/m³: Air purifying, full-facepiece respirator with high-efficiency particulate filter(s), any powered air-purifying respirator with tight-fitting facepiece and high-efficiency particulate filter(s) or full-facepiece SCBA, or full-facepiece SAR.
- Up to 100 mg/m³: Positive pressure, full-facepiece SAR.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full-facepiece SCBA, or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

NOTE: The IDLH concentration for Copper dusts and mists (as Cu) is 100 mg/m³.

Personal Protective Equipment: General

Wash hands thoroughly after handling material. Do not eat, drink or smoke in work areas. Have a safety shower or eye-wash fountain available. Use good hygiene practices when handling this material including changing and laundering work clothing after use. Discard contaminated shoes and leather goods.

Protective Clothing Pictograms

![Splash Goggles](image1)
![Gloves](image2)
![Protective Apron](image3)
![Dust Respirator](image4)

### **Section 9 - Physical & Chemical Properties**

**Physical Properties: Additional Information**

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

**Appearance:** Blue crystals or powder

**Physical State:** Solid

**Vapor Pressure:** Not applicable

**Initial boiling point and boiling range:** Not applicable

**Solubility (H2O):** 31.6 g/100 cc (@ 20 deg C)

**Molecular Weight:** 249.68

**Flash Point:** Not flammable

**Upper Flammable Limit (UEL):** Not applicable

**Auto Ignition temperature:** Not applicable

**Rate of Burning:** Not applicable

**Odor threshold:** Not applicable

**Partition coefficient: n-octanol/water:** No data available

**Viscosity:** Not applicable

**Odor:** Odorless

**pH:** 3.7-4.2 (10% soln.)

**Vapor Density:** Not applicable

**Freezing/Melting Point:** 150 deg C (302 deg F)

**Specific Gravity:** 2.28 @ 15.6 deg C (H2O = 1)

**Particle Size:** Various

**Bulk Density:** Not available

**Chemical Formula:** CuSO4*5H2O

**Lower Flammable Limit (LEL):** Not applicable

**Flammability (solid, gas):** Not flammable

**Relative density:** No data available

**Evaporation rate:** Not applicable

**Decomposition temperature:** 560 deg C (Copper Sulfate)
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Material Name: Copper Sulfate Pentahydrate
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Chemical Stability
Copper Sulfate Pentahydrate is hygroscopic, but stable when kept dry, under normal temperature and pressures.

Chemical Stability: Conditions to Avoid
Avoid high temperatures, exposure to air and incompatible materials.

Incompatibility
Copper Sulfate causes hydroxylamine to ignite and the hydrated salt is vigorously reduced. Solutions of sodium hypobromite are decomposed by powerful catalytic action of cupric ions, even as impurities. Copper salts, including Copper Sulfate may react to form explosive acetylides when in contact with acetylene or nitromethane. Contact with reducing agents, can cause a vigorous reaction, especially in solution. This product can corrode aluminum, steel and iron. Copper Sulfate Pentahydrate is incompatible with magnesium, strong bases, alkalines, phosphates, acetylene, hydrazine, and zirconium.

Hazardous Decomposition
Sulfur oxides and Copper oxides.

Hazardous Polymerization
Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity
A: General Product Information
Acute toxicity is largely due to the corrosive (acidic) properties of this material. Harmful or fatal if swallowed. Product causes serious eye damage. Product may cause skin irritation. Product may cause respiratory tract irritation, and inhalation may cause nose irritation, sore throat, coughing, and chest tightness and possibly, ulceration and perforation of the nasal septum.
Chronic: Long term skin overexposure to this product may lead to dermatitis and eczema. Prolonged or repeated eye contact may cause conjunctivitis and possibly corneal abnormalities. Chronic overexposure to this product may cause liver and kidney damage, anemia and other blood cell abnormalities.

B: Component Analysis - LD₅₀/LC₅₀
Copper Sulfate Pentahydrate (7758-99-8)
Oral-rat LD₅₀ = 330 mg/kg (testing done June 2006, Consumer Product Testing Co., Inc.); Intraperitoneal-rat LD₅₀: 18,700 mg/kg; Intraperitoneal-rat LD₅₀: 20 mg/kg; Subcutaneous-rat LD₅₀: 43 mg/kg; Intravenous-rat LD₅₀: 48900 µg/kg; Unreported-rat LD₅₀: 520 mg/kg; Oral-mouse LD₅₀: 369 mg/kg; Intraperitoneal-Mouse LD₅₀: 33 mg/kg; Intraperitoneal-mouse LD₅₀: 7182 µg/kg; Intravenous-mouse LD₅₀: 23300 µg/kgB: Component Analysis - TDLo/LDLo Copper Sulfate Pentahydrate (7758-99-8)
Oral-man LDLo: 857 mg/kg; Oral-Human LDLo: 50 mg/kg: Behavioral: somnolence (general depressed activity); Kidney, Urethra, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Blood: hemorrhage; Oral-Human TDLo: 11 mg/kg: Gastrointestinal: gastritis; Gastrointestinal: hypermotility, diarrhea, nausea or vomiting; Oral-Human TDLo: 272 mg/kg: liver, kidney, Blood effects; Oral-Human LDLo: 1088 mg/kg; Oral-child : 150 mg/kg: Kidney, Urethra, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Blood: other hemolysis with or without anemia; unknown-Man LDLo: 221 mg/kg; Oral-Woman TDLo: 2400 mg/kg/day: Gastrointestinal tract effects; DNA Inhibition-Human: lymphocyte 76 mmol/L; Oral-woman LDLo: 100 mg/kg: Vascular: Blood pressure lowering not characterized in autonomic section; Liver: hepatitis (hepatocellular necrosis), diffuse; Kidney, Urethra, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis); Oral-Human LDLo: 143 mg/kg: Pulmonary system effects, Gastrointestinal tract effects; Oral-rat TDLo: 915 mg/kg/1 year-intermittent: Cardiac: changes in coronary arteries; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol; Oral-rat TDLo: 157 mg/kg/6 weeks-intermittent; Endocrine: changes in adrenal weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases; Oral-rat TDLo: 7530 mg/kg/30 days-intermittent: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Blood: changes in erythrocyte (RBC) count; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effect; Oral-rat TDLo: 2 gm/kg/20 days-intermittent: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases; Enzyme inhibition, induction, or change in blood or tissue levels: Intraperitoneal-rat TDLo: 791 mg/kg/18 weeks-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain; Intraperitoneal-rat TDLo: 7500 µg/kg/ female 3 day(s) after conception: Reproductive: Fertility: other measures of fertility; Subcutaneourat TDLo: 12768 µg/kg/ male 1 day(s) pre-mating: Reproductive: Paternal Effects: testes, epididymis, sperm duct; Intratesticular-rat TDLo:3192 µg/kg; male 1 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct; Oral-mouse TDLo: 3 gm/kg/8 weeks-continuous: Blood: changes in spleen; Immunological Including Allergic: decrease...
Carcinogenicity
A: General Product Information
Copper Sulfate Pentahydrate (7758-99-8)
Cytogenetic Analysis-Rat/ast 300 mg/kg

B: Component Carcinogenicity
This product is not listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology
No information available.

Neurotoxicity
Has not been identified.

Mutagenicity
Human and animal mutation data are available for Copper Sulfate Pentahydrate; these data were obtained during clinical studies on specific human and animal tissues exposed to high doses of this compound.

Teratogenicity
There are no reports of teratogenicity in humans. Animal studies indicate that a deficiency or excess of copper in the body can cause significant harm to developing embryos. The net absorption of copper is limited and toxic levels are unlikely from industrial exposure.

Other Toxicological Information
Individuals with Wilson’s disease are unable to metabolize copper. Thus, persons with pre-existing Wilson’s disease may be more susceptible to the effects of overexposure to this product.

Ecotoxicity
A: General Product Information
Harmful to aquatic life in very low concentrations. Copper Sulfate Pentahydrate is toxic to fish and marine organisms when applied to streams, rivers, ponds or lakes.

B: Ecotoxicity
Copper Sulfate Pentahydrate (7758-99-8)

Environmental Fate
If released to soil, copper sulfate may leach to groundwater, be partly oxidized or bind to humic materials, clay or hydromic oxides of iron and manganese. In water, it will bind to carbonates as well as humic materials, clay and hydromic oxides of iron and manganese. Copper is accumulated by plants and animals, but it does not appear to biomagnify from plants to animals. In air, copper aerosols have
Safety Data Sheet

Material Name: Copper Sulfate Pentahydrate   ID: C1-121A

a residence time of 2 to 10 days in an unpolluted atmosphere and 0.1 to greater than 4 days in polluted, urban areas.

LC₅₀ (Lepomis machocharius bluegill) wt 1.5 g = 884 mg/L at 18°C, static bioassay (95% confidence limit 707-1,100 mg/L) (technical material, 100% (about 25% elemental copper); LC₅₀ (Leopimis cyanellus, Green Sunfish) = 1.1 g, 3,510 µg/L at °C; LC₅₀ (Pimephales promelas, Fat-head minnow) = 1.2 g, 838 µg/L at 18°C; LC₅₀ (Crassius auratus, Goldfish) = 0.9 g, 1380 µg/L at 18°C; LC₅₀ (Crassius auratus, Goldfish) = 0.1-2.5 mg/L; LC₅₀ (EEL) = 0.1-2.5 mg/L; LC₅₀ (Salmo gairdneri, Rainbow trout) = 1.6 g, 135 µg/L at 18°C; LC₅₀ (Salmo gairdneri, Rainbow trout) 48 hours =0.14 ppm; LC₅₀ (Daphnia magna) no time specified = 0.182 mg/L; LC₅₀ (Salmo gairdneri, Rainbow trout) no time specified = 0.17 mg/L; LC₅₀ (Lepomis machocharius, Blue Gill) no time specified = 1.5 g, 884 µg/L at 18°C; LC₅₀ (Stripped Bass) 96 hours = 1 ppm or lower; LC₅₀ (Prawn) 48 hours = 0.14; LC₅₀ (Shrimp) 96 hours = 17.0 ppm copper; LC₅₀ (Blue Crab) 96 hours = 28 ppm copper; LC₅₀ (Oyster) 96 hours = 5.8 ppm copper; LC₅₀ (Viviparus bengalensis snail) 96 hours = 0.060 ppm copper (at 32.5°C; 0.066 ppm copper static bioassay); LC₅₀ (Viviparus bengalensis snail) 96 hours = 0.09 ppm copper (at 27.3°C; 0.066 ppm copper static bioassay); LC₅₀ (Viviparus bengalensis snail) 96 hours = 0.39 ppm copper (at 20.3°C; 0.066 ppm copper static bioassay)

**Section 13 - Disposal Considerations**

**A: General Product Information**

This product is a registered pesticide.

**B: Component Waste Numbers**

No EPA Waste Numbers are applicable for this product's components.

**Disposal Instructions**

All wastes must be handled in accordance with local, state and federal regulations or with regulations of Canada and its Provinces. This material can be converted to a less hazardous material by weak reducing agents followed by neutralization. Do not reuse empty containers. Do not rinse unless required for recycling. If partly filled, call local solid waste agency for disposal instructions. Never pour unused product down drains or on the ground.

**Pesticide Disposal**

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticides, spray mixtures, or rinsate is a violation of U.S. Federal and Canadian Law. If these wastes cannot be disposed of by use, according to product label instruction, contact your U.S. State, or Canadian Province Pesticide or Environmental Control Agency, or the hazardous waste representative at the nearest U.S. EPA Regional Office, or the offices of Environment Canada for guidance.

**Section 14 – Transport Information Ground**

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under 49 CFR, IATA and IMDG to assure regulatory compliance.

US DOT 49 CFR 100-185 Revised April 24.2017 Information

UN/NA #: UN 3077

**Shipping Name:** Environmentally Hazardous Substance, solid, n.o.s. (cupric sulfate)

**Hazard Class:** 9

**Packing Group:** III

**Required Label(s):** Class 9

**Special Provision:** 8, 146, 335, A112, B54, IB8, IP2, N20, T1, TP33

**Packaging:** 172.155, 172.213

**RQ Quantity:** For a single package, less than the RQ of 10lb (4.54 kg), the RQ designation should be not be used.
Additional Shipping Information

Limited Quantity Shipments: Shipments, except for air, need not be marked with the Proper Shipping Name and UN # of the contents, but shall be marked with a diamond. The top and bottom portions of the square-on-point must be black and the center white or of a suitable contrasting background. The mark must be at least 2 mm. Each side must have a minimum dimension of 100 mm. Small packages which cannot reasonably accommodate a 100-mm square-on-point mark may be marked with a square-on-point mark with a minimum side dimension of 50 mm. The total weight of each outer packaging cannot exceed 30 kg (66 pounds).

Small Quantities for Highway and Rail: The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle. The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement of the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29 kg (64 pounds). The completed package must meet the drop test requirements of 173.4(6) (I). The outside of the package must be marked with the statement “This package conforms to 49 CFR 173.4 for domestic highway or rail transport only.”

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 1000 g (2.2 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29 kg (64 pounds). The completed package must meet a drop test. The requirements are found in 173.4(6) (I). The package must not be opened or otherwise altered until it is no longer in commerce. For highway or rail transportation no shipping paper is required. The package must be legibly marked with the following marking:

NOTE: The “*” must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The “**” must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm (3.9 inches) x 100 mm (3.9 inches), and must be durable and clearly visible.

De minimis Exceptions: The maximum quantity of this material per inner receptacle is limited to 1 g (0.04 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 100 g (0.22 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29 kg (64 pounds). The completed package must meet the drop test. The requirements are found in 173.4(6) (I). The package must not be opened or otherwise altered until it is no longer in commerce and may be transported by aircraft. If all of the above requirements are met, then this material is not regulated.

*** Section 14 – Transport Information Air ***

58th Edition International Air Transport Association (IATA):
For Shipments by Air transport: This information applies to air shipments both within the U.S. and for shipments originating in the U.S., but being shipped to a different country.
Safety Data Sheet

Material Name: Copper Sulfate Pentahydrate

ID: C1-121A

UN/NA #: UN 3077
Proper Shipping Name: Environmentally Hazardous Substance, solid, n.o.s. (cupric sulfate)
Hazard Class: 9 (Miscellaneous Dangerous Goods)
Packing Group: III
Passenger & Cargo Aircraft Packing Instruction: 956
Passenger & Cargo Aircraft Maximum Net Quantity: 400 kg
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y956
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg

Excepted Quantities:
- Excepted Quantity Maximum inner package: 30g
- Excepted Quantity Maximum outer package: 1kg
- Cargo Aircraft Only Packing Instruction: 956
- Cargo Aircraft Only Maximum Net Quantity: 400 kg

Special Provisions: A97, A158, A179 A197
ERG: 9L

Limited Quantity Shipments: Shipments for air must be marked with the Proper Shipping Name and UN # shall on the package. The top and bottom portions of the square-on-point must be black and the center white or of a suitable contrasting background and the symbol “Y” must be black and located in the center of the square-on-point. The mark must be at least 2 mm. Each side must have a minimum dimension of 100 mm. Small packages which cannot reasonably accommodate a 100mm square-on-point mark may be marked with a square-on-point mark with a minimum side dimension of 50 mm. The total weight of each outer packaging cannot exceed 30 kg.

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g per receptacle and the aggregate quantity of this material per completed package does not exceed 1kg. The inner receptacles must be securely packed in an intermediate packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg. The completed package must meet a drop test. The requirements are found in 2.7.6.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air transportation, no shipping paper is required. The package must be legibly marked with the following marking:

NOTE: The *** must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The **** must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.

*** Section 14 – Transport Information Vessel ***
Safety Data Sheet

Material Name: Copper Sulfate Pentahydrate

Amendment 38-16 International Maritime Dangerous Goods (IMDG) Code

For shipments via marine vessel transport, the following classification information applies.

UN/NA #: UN 3077
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Cupric sulfate)
Hazard Class: 9
Packing Group: III
Special Provisions: 274, 335, 966, 967
Limited Quantities: 5 kg
Excepted Quantities: E1
Packing Instructions: P002/LP02
Provisions: PP12
IBC Instructions: IBC08
IBC Provisions: B2
EmS: F-A, S-F
Stowage and Handling: Category A., SW23
Segregation: None

Marine Pollutant: This material is considered a marine pollutant by the IMO and shipments of the material must carry the new marking
Refer to IMO Amendment 36-12 Chapter 2.9 and 2.10.

Limited Quantity Shipments: Shipments need not be marked with the Proper Shipping Name of the contents, but shall be marked with a diamond. The top and bottom portions of the square-on-point must be black and the center white or of a suitable contrasting background. The mark must be at least 2 mm. Each side must have a minimum dimension of 100 mm. Small packages which cannot reasonably accommodate a 100-mm square-on-point mark may be marked with a square-on-point mark with a minimum side dimension of 50 mm. The total weight of each outer packaging cannot exceed 30 kg (66 pounds).

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g per receptacle and the aggregate quantity of this material per completed package does not exceed 1000g. The inner receptacles must be securely packed in an intermediate packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg. The completed package must meet a drop test. The requirements are found in 3.5.3.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air transportation, no shipping paper is required. The package must be legibly marked with the following marking:

NOTE: The """" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package.
The """" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.

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**US Federal Regulations**

**A: General Product Information**

Copper Sulfate Pentahydrate (CAS # 7758-99-8) is listed as a Priority and Toxic Pollutant under the Clean Water Act.

**B: Component Analysis**

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

- **Copper Compounds (7440-50-8)**
  - SARA 313: final RQ = 5000 pounds (2270 kg) Note: No reporting of releases of this substance is required if the diameter of the pieces of the solid metal released is equal to or greater than 0.004 inches.

- **Cupric Sulfate (7758-98-7)**
  - CERCLA: final RQ = 10 pounds (4.54 kg)

**C: Sara 311/312 Tier II Hazard Ratings:**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Fire Hazard</th>
<th>Reactivity Hazard</th>
<th>Pressure Hazard</th>
<th>Immediate Health Hazard</th>
<th>Chronic Health Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper Sulfate Pentahydrate</td>
<td>7758-99-8</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**State Regulations**

**A: General Product Information**

California Proposition 65

Copper Sulfate Pentahydrate is not on the California Proposition 65 chemical lists.

**B: Component Analysis - State**

The following components appear on one or more of the following state hazardous substance lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>CA</th>
<th>FL</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Copper, fume, dust and mists</td>
<td>N/A</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Copper Sulfate Pentahydrate</td>
<td>7758-99-8</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Other Regulations**

**A: General Product Information**

When used as a pesticide, the requirements of the U.S. Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), or requirements under the Canadian Pest Control Act, are applicable.

**B: Component Analysis - Inventory**

Although this compound is not on the TSCA Inventory, it is excepted as a hydrate of a listed compound, Copper Sulfate (CAS # 7758-98-7), per 40 CFR 710.4 (d)(3) and 40 CFR 720.30 (h)(3). Under this section of TSCA, any chemical substance which is a hydrate of a listed compound is excepted.

**C: Component Analysis - WHMIS IDL**

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Minimum Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper Sulfate Pentahydrate</td>
<td>7758-99-8</td>
<td>1 percent</td>
</tr>
</tbody>
</table>
Safety Data Sheet

Material Name: Copper Sulfate Pentahydrate  ID: C1-121A

Other Information
Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product(s) and/or the program(s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

Key/Legend
EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Chem One Ltd.  Contact Phone: (713) 896-9966

Revision log
07/24/00 4:24 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.
07/27/00 2:49 PM SEP Added “Fine 200, FCC IV, Very High Purity” to synonyms, Section 1
08/23/00 3:15 PM SEP Added “Copper Sulfate Crystals” to synonyms, Section 1
05/31/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings.
06/01/01 7:28 AM HDF Added text to label information from EPA Approved Label.
07/24/01 4:31 AM CLJ Added Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.
09/18/01 11:34 AM SEP Added Domestic Transportation Exception, Sect 14
10/05/01 3:30 PM SEP Deleted Alternate Shipping Name, Sect 14
02/15/02 11:01 AM: HDF Revision of SARA Chronic Hazard Rating to “Yes”.
2/21/02 4:21 PM HDF Added more information on Marine Pollutant Markings and Limited Quantity Shipments
9/16/03: 3:45 PM HDF Addition of chronic health hazard information. Addition of inhalation hazard information, Section 3. Section 4. expansion of information on Information for Physicians. Up-graded Section 10 Reactivity Information. Up-Dated entire Section 14 Transportation Information to include IATA, IMO and current Canadian transport information.
06/22/05 2:24PM SEP Update IATA Section 14
01/06/2006 10:12 am SEP Corrected Section 14 DOT domestic transport exception to read 49 CFR 172.322 (d) (3).
09/08/06 2:52PM SEP Updated DOT and IMO Section 14 SEP
09/25/06 08:43 HDF Review of new toxicological data and addition of data to Section 11.
10/17/06 12:15 pm SEP Updated Section 11.
10/16/07 9:48am SEP Updated Section 14- IATA
10/10/08 3:48 PM DLY Changed Chem One Physical Address, Section 1
09/18/09 MMK Updated Section 14 limited &excepted quantities and exceptions, updated REI and treatment interval per EPA label RED
04 /07/ 11 SEP Add “F 25” Section 1
01/14/2015 GHS revision all sections
04/28/2017 Section 14
05/03/2017 Revised Section 7 Storage Procedures

Revised By:
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05/15/2019 Revised Sections 2, 4, 5, 9, 11 and 16