Copper Sulfate
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Revision date: 11/12/2015

SECTION 1: Identification of the substance/mixture

1.1. Product identifier
Product form : Substance
Substance name : Copper Sulfate Pentahydrate
Formula : CuSO₄·5H₂O
Molecular weight : 249.69 g/mol
CAS No. : 7758-99-8
Product code : LW-CUSO₄
Synonyms : Copper(II) sulfate Pentahydrate

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture : Laboratory chemicals, Manufacture of substances

1.3. Emergency telephone number
Emergency number : 1.800.424.9300 (USA)
+1.703.527.3887 (INT)

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2. GHS Label elements, including precautionary statements

Pictogram : ! ⚠ ⚠
Signal word : Warning
Hazard statement(s)
H302 : Harmful if swallowed.
H315 : Causes skin irritation.
H319 : Causes serious eye irritation.
H410 : Very toxic to aquatic life with long lasting effects.
Precautionary statement(s)

P264 : Wash skin thoroughly after handling.
P270 : Do not eat, drink or smoke when using this product.
P273 : Avoid release to the environment.
P280 : Wear eye protection/ face protection.
P280 : Wear protective gloves.
P301 + P312 + P330 : Wear protective gloves.
P302 + P352 : IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332 + P313 : If skin irritation occurs: Get medical advice/ attention.
P332 + P313 : If eye irritation persists: Get medical advice/ attention.
P362 : Take off contaminated clothing and wash before reuse.
P391 : Collect spillage.
P501 : Dispose of contents/ container to an approved waste disposal plant.

2.3. Hazards not otherwise classified (HNOC) or not covered by GHS

none

SECTION 3: Composition/information on ingredients

3.1. Substances

Synonyms : Copper(II) sulfate Pentahydrate
Formula : CuSO₄.5H₂O
Molecular Weight : 249.69 g/mol
CAS-No. : 7758-99-8

Hazardous components

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper sulphate pentahydrate</td>
<td>Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A; Aquatic Acute 1; Aquatic Chronic 1; H302, H315, H319, H410</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.
**SECTION 4: Description of first aid measures**

4.1. Description of first aid measures

**General advice**: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**First-aid measures after inhalation**: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**First-aid measures after skin contact**: Wash off with soap and plenty of water. Consult a physician.

**First-aid measures after eye contact**: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**First-aid measures after ingestion**: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

4.3. Indication of any immediate medical attention and special treatment needed

No data available

**SECTION 5: Firefighting measures**

5.1. Extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Sulphur oxides, Copper oxides.

5.3. Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4. More Information

No data available.

**SECTION 6: Accidental release measures**

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Avoid breathing dust.

For personal protection see section 8.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
6.3. **Methods and material for containment and cleaning up**
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4. **Reference to other sections**
For disposal see section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

### 7.2. Conditions for safe storage, including any incompatibilities

### 7.3. Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper sulphate pentahydrate</td>
<td>7758-99-8</td>
<td>TWA</td>
<td>1.000000 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1.000000 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
</tbody>
</table>

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
8.2. Exposure controls

Appropriate engineering controls: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3. Personal protective equipment

Eye protection: Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin Protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)
data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body protection: Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection: For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type
Copper Sulfate
Safety Data Sheet

Environmental exposure controls: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Form: crystalline</td>
</tr>
<tr>
<td></td>
<td>Color: blue</td>
</tr>
<tr>
<td>Odor</td>
<td>No data available</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>3.7 - 4.5 at 50 g/l at 25 °C (77 °F)</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>Melting point/range: 110 °C (230 °F)</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>9.7 hPa (7.3 mmHg) at 25 °C (77 °F)</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>2.284 g/cm3</td>
</tr>
<tr>
<td>Water solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other information

No data available
SECTION 10: Stability and reactivity

10.1. Reactivity
No data available

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
No data available

10.4. Conditions to avoid
No data available

10.5. Incompatible materials
Powdered metals, Anhydrous copper(II) sulfate, reacts violently with:; hydroxylamine, Magnesium

10.6. Hazardous decomposition products
Other decomposition products - No data available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 482 mg/kg
(OECD Test Guideline 401)
Remarks: anhydrous
Aldrich - 469130
Inhalation: No data available
LD50 Dermal - Rat - > 2,000 mg/kg
Remarks: anhydrous
No data available

Skin corrosion/irritation
Irritating to skin.

Serious eye damage/irritation
Irritating to eyes.

Respiratory or skin sensitization
Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

Germ cell mutagenicity
No data available

Carcinogenicity
IARC:
No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
Copper Sulfate
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: No data available

Specific target organ toxicity (single exposure): No data available

Specific target organ toxicity (repeated exposure): No data available

Aspiration hazard: No data available

Additional Information
RTECS: GL8900000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1. Toxicity
Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) - 0.024 mg/l - 48 h

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) - 9.6 mg/l - 48 h

12.2. Persistence and degradability
Biodegradability: The methods for determining the biological degradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential: No data available

12.4. Mobility in soil: No data available

12.5. Results of PBT and vPvB assessment: PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6. Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life with long lasting effects.
# Copper Sulfate
Safety Data Sheet

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

<table>
<thead>
<tr>
<th>Product</th>
<th>Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contaminated Packaging</td>
<td>Dispose of as unused product.</td>
</tr>
</tbody>
</table>

## SECTION 14: Transport information

### DOT (US)

<table>
<thead>
<tr>
<th>UN number</th>
<th>3077</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>9</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Environmentally hazardous substances, solid, n.o.s. (Copper sulfate pentahydrate)</td>
</tr>
<tr>
<td>Reportable Quantity (RQ)</td>
<td>10 lbs</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>yes</td>
</tr>
<tr>
<td>Poison Inhalation Hazard</td>
<td>yes</td>
</tr>
</tbody>
</table>

### IMDG

<table>
<thead>
<tr>
<th>UN number</th>
<th>3077</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>9</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>EMS-No</td>
<td>F-A, S-F</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper sulfate pentahydrate)</td>
</tr>
<tr>
<td>Marine pollutant</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### IATA

<table>
<thead>
<tr>
<th>UN number</th>
<th>3077</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
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<td>Environmentally hazardous substance, solid, n.o.s. (Copper sulfate pentahydrate)</td>
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</tbody>
</table>

## SECTION 15: Regulatory information
Copper Sulfate
Safety Data Sheet

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:
Copper sulphate pentahydrate  7758-99-8  Revision Date
1993-04-24

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
Copper sulphate pentahydrate  CAS-No.  Revision Date
7758-99-8  1993-04-24

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components
Copper sulphate pentahydrate  CAS-No.  Revision Date
7758-99-8  1993-04-24

New Jersey Right To Know Components
Copper sulphate pentahydrate  CAS-No.  Revision Date
7758-99-8  1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information
Full text of H-Statements referred to under sections 2 and 3.
Acute Tox.  :  Acute toxicity
Aquatic Acute  :  Acute aquatic toxicity
Aquatic Chronic  :  Chronic aquatic toxicity
Eye Irrit.  :  Eye irritation
H302  :  Harmful if swallowed.
H315  :  Causes skin irritation.
H319  :  Causes serious eye irritation.
H400  :  Very toxic to aquatic life.
Met. Corr.  :  Corrosive to metals
Copper Sulfate
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

HMIS Rating
Health Hazard : 2
Chronic Health Hazard : *
Flammability : 0
Physical Hazard : 0

NFPA Rating
Health hazard : 0
Fire Hazard : 0
Reactivity Hazard : 0

Further Information
Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and Loudwolf Holdings Ltd. assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his/her application.