# Copper (II) Sulfate, Pentahydrate

## Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 05/07/2008  
Revision date: 05/02/2017  
Supersedes: 10/01/2013  
Version: 1.3

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## SECTION 1: Identification

### 1.1. Identification

<table>
<thead>
<tr>
<th>Product form</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance name</td>
<td>Copper (II) Sulfate, Pentahydrate</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>7758-99-8</td>
</tr>
<tr>
<td>Product code</td>
<td>LC13405</td>
</tr>
<tr>
<td>Formula</td>
<td>CuSO4.5H2O</td>
</tr>
<tr>
<td>Synonyms</td>
<td>blue vitriol / cupric sulfate, pentahydrate</td>
</tr>
</tbody>
</table>

### 1.2. Recommended use and restrictions on use

Use of the substance/mixture: For laboratory and manufacturing use only.

Recommended use: Laboratory chemicals

Restrictions on use: Not for food, drug or household use

### 1.3. Supplier

LabChem Inc  
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court  
Zelienople, PA 16063 - USA  
T 412-826-5230 - F 724-473-0647  
info@labchem.com - www.labchem.com

### 1.4. Emergency telephone number

Emergency number: CHEMTREC: 1-800-424-9300 or +1-703-741-5970

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## SECTION 2: Hazard(s) identification

### 2.1. Classification of the substance or mixture

<table>
<thead>
<tr>
<th>GHS-US classification</th>
<th>Hazard statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity (oral)</td>
<td>H301 - Toxic if swallowed</td>
</tr>
<tr>
<td>Hazard Category 3</td>
<td>H400 - Very toxic to aquatic life</td>
</tr>
<tr>
<td>Hazard Category 1</td>
<td>H410 - Very toxic to aquatic life with long lasting effects</td>
</tr>
<tr>
<td>Hazardous to the aquatic environment - Acute</td>
<td></td>
</tr>
<tr>
<td>Hazardous to the aquatic environment - Chronic</td>
<td></td>
</tr>
</tbody>
</table>

Full text of H statements: see section 16

### 2.2. GHS Label elements, including precautionary statements

#### GHS-US labeling

- **Signal word (GHS-US)**: Danger
- **Hazard pictograms (GHS-US)**: ![GHS06](image1) ![GHS09](image2)
- **Hazard statements (GHS-US)**:  
  - H301 - Toxic if swallowed  
  - H400 - Very toxic to aquatic life  
  - H410 - Very toxic to aquatic life with long lasting effects
- **Precautionary statements (GHS-US)**:  
  - P264 - Wash exposed skin thoroughly after handling.  
  - P270 - Do not eat, drink or smoke when using this product.  
  - P273 - Avoid release to the environment.  
  - P310 - Immediately call a poison center or doctor/physician.  
  - P330 - If swallowed, rinse mouth  
  - P391 - Collect spillage.  
  - P405 - Store locked up.  
  - P501 - Dispose of contents/container to comply with local, state and federal regulations

### 2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification: None.
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2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances
Substance type: Mono-constituent

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper (II) Sulfate, Pentahydrate (Main constituent)</td>
<td>(CAS-No.) 7758-99-8</td>
<td>100</td>
<td>Acute Tox. 3 (Oral), H301 Aquatic Acute 1, H400 Aquatic Chronic 1, H410</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements: see section 16

3.2. Mixtures
Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general:

First-aid measures after inhalation:
Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service. Allow victim to breathe fresh air. Allow the victim to rest.

First-aid measures after skin contact:
Wash immediately with lots of water. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists. Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

First-aid measures after eye contact:
Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists. Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persists.

First-aid measures after ingestion:

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation:
AFTER INHALATION OF DUST: Dry/sore throat. Coughing. ON HEATING: Metal fume fever.

Symptoms/effects after skin contact:
Tingling/irritation of the skin.

Symptoms/effects after eye contact:
Irritation of the eye tissue.

Symptoms/effects after ingestion:

Chronic symptoms:

4.3. Immediate medical attention and special treatment, if necessary
No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:

Unsuitable extinguishing media:
No unsuitable extinguishing media known. Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Fire hazard:
DIRECT FIRE HAZARD. Non combustible. INDIRECT FIRE HAZARD. Reactions involving a fire hazard: see "Reactivity Hazard".

Explosion hazard:
DIRECT EXPLOSION HAZARD. No data available on direct explosion hazard. INDIRECT EXPLOSION HAZARD. No data available on indirect explosion hazard.
Reactivity: Reacts on exposure to water (moisture) with (some) metals. On burning: release of toxic and corrosive gases/vapours (sulphur oxides) and formation of metallic fumes. Reacts exothermically with (some) compounds: (increased) risk of fire. Reacts violently with (strong) reducers.

5.3. Special protective equipment and precautions for fire-fighters

Precautionary measures fire: Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

Firefighting instructions: Dilute toxic gases with water spray. Take account of environmentally hazardous firefighting water. Use water moderately and if possible collect or contain it. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent firefighting water from entering environment.

Protection during firefighting: Heat/fire exposure: compressed air/oxygen apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel


Measures in case of dust release: In case of dust production: keep upwind. Dust production: have neighbourhood close doors and windows.

6.1.2. For emergency responders

Protective equipment: Equip cleanup crew with proper protection.

Emergency procedures: Ventilate area.

6.2. Environmental precautions

Prevent soil and water pollution. Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up

For containment: Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Dam up the solid spill. Knock down/dilute dust cloud with water spray.


6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Avoid raising dust. Keep away from naked flames/heat. Observe strict hygiene. Keep container tightly closed. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor.

Hygiene measures: Do not eat, drink or smoke when using this product. Wash exposed skin thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Keep only in the original container in a cool, well ventilated place away from: incompatible materials. Keep container closed when not in use.

Incompatible products: Strong bases. Strong reducing agents.

Incompatible materials: Sources of ignition. Direct sunlight.

Heat-ignition: KEEP SUBSTANCE AWAY FROM: heat sources.

Prohibitions on mixed storage: KEEP SUBSTANCE AWAY FROM: reducing agents. (strong) bases. water/moisture.
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Storage area
- Store in a dry area. Keep container in a well-ventilated place. Meet the legal requirements. Keep out of direct sunlight.

Special rules on packaging
- SPECIAL REQUIREMENTS: hermetic, watertight, dry, clean, correctly labelled, meet the legal requirements. Secure fragile packagings in solid containers.

Packaging materials
- SUITABLE MATERIAL: No data available. MATERIAL TO AVOID: No data available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
- No additional information available

8.2. Appropriate engineering controls
- Appropriate engineering controls: Emergency eye wash fountains should be available in the immediate vicinity of any potential exposure.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:
- Gloves. Safety glasses.

Materials for protective clothing:
- GIVE GOOD RESISTANCE: butyl rubber. PVC. viton

Hand protection:
- Gloves. Wear protective gloves.

Eye protection:
- Face shield. In case of dust production: protective goggles

Skin and body protection:
- Protective clothing. In case of dust production: head/neck protection. In case of dust production: dustproof clothing

Respiratory protection:
- Dust production: dust mask with filter type P2.
- Dust production: dust mask with filter type P3.
- Wear appropriate mask

Other information:
- Do not eat, drink or smoke during use.

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>Physical state</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Crystalline solid. Crystalline powder.</td>
</tr>
<tr>
<td>Color</td>
<td>Blue</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>4 (3.2 %)</td>
</tr>
<tr>
<td>pH solution</td>
<td>3.2 %</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
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Relative evaporation rate (butyl acetate=1): No data available
Flammability (solid, gas): Non flammable.
Vapor pressure: No data available
Relative vapor density at 20 °C: No data available
Relative density: 2.3
Specific gravity / density: 2286 kg/m³
Molecular mass: 249.68 g/mol
Solubility: Soluble in water. Soluble in methanol. Soluble in glycerol.
           Water: 23 g/100ml
           Ethanol: 16 g/100ml (18 °C)
Log Pow: No data available
Auto-ignition temperature: No data available
Decomposition temperature: > 110 °C
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available
Explosion limits: No data available
Explosive properties: No data available
Oxidizing properties: No data available

9.2. Other information
VOC content: 0 %
Other properties: Hygroscopic. Substance has acid reaction.

SECTION 10: Stability and reactivity

10.1. Reactivity
Reacts on exposure to water (moisture) with (some) metals. On burning: release of toxic and corrosive gases/vapours (sulphur oxides) and formation of metallic fumes. Reacts exothermically with (some) compounds: (increased) risk of fire. Reacts violently with (strong) reducers.

10.2. Chemical stability
Hygroscopic. Not established.

10.3. Possibility of hazardous reactions
Not established.

10.4. Conditions to avoid
Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials
Strong acids. Strong bases.

10.6. Hazardous decomposition products
Fume. Sulfur compounds.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Likely routes of exposure: Inhalation; Skin and eye contact
Acute toxicity: Not classified

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LD50 oral rat: 300 mg/kg (Rat; OECD 401: Acute Oral Toxicity; Experimental value; 482 mg/kg bodyweight; Rat)
LD50 dermal rabbit: > 2000 mg/kg (Rabbit; Literature study; OECD 402: Acute Dermal Toxicity)
ATE US (oral): 300 mg/kg body weight

Skin corrosion/irritation: Not classified
pH: 4 (3.2 %)

Serious eye damage/irritation: Not classified
pH: 4 (3.2 %)

Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified. Based on available data, the classification criteria are not met.

Carcinogenicity: Not classified.

Reproductive toxicity: Not classified. Based on available data, the classification criteria are not met.

Specific target organ toxicity – single exposure: Not classified.

Specific target organ toxicity – repeated exposure: Not classified.

Aspiration hazard: Not classified.

Potential Adverse human health effects and symptoms:

Symptoms/effects after inhalation: AFTER INHALATION OF DUST: Dry/sore throat. Coughing. ON HEATING: Metal fume fever.

Symptoms/effects after skin contact: Tingling/irritation of the skin.

Symptoms/effects after eye contact: Irritation of the eye tissue.


SECTION 12: Ecological information

12.1. Toxicity

Ecology - general: Dangerous for the environment.


12.2. Persistence and degradability

Copper (II) Sulfate, Pentahydrate (7758-99-8) ThOD: Not applicable

Persistence and degradability: Not established.

Biochemical oxygen demand (BOD): Not applicable

Chemical oxygen demand (COD): Not applicable

12.3. Bioaccumulative potential


12.4. Mobility in soil


12.5. Other adverse effects

Other information: Avoid release to the environment.

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SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations: Remove waste in accordance with local and/or national regulations. Recycle/reuse. Do not discharge into the sewer. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to comply with local, state and federal regulations.

Additional information: LWCA (the Netherlands): KGA category 05. Hazardous waste according to Directive 2008/98/EC.

Ecology - waste materials: Avoid release to the environment. Hazardous waste due to toxicity.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description: UN3077 Environmentally hazardous substances, solid, n.o.s., 9, III

UN-No.(DOT): UN3077

Proper Shipping Name (DOT): Environmentally hazardous substances, solid, n.o.s.

Transport hazard class(es) (DOT): 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140

Packing group (DOT): III - Minor Danger

Hazard labels (DOT): 9 - Class 9 (Miscellaneous dangerous materials)

Dangerous for the environment: Yes

Marine pollutant: Yes

DOT Packaging Non Bulk (49 CFR 173.xxx): 213

DOT Packaging Bulk (49 CFR 173.xxx): 240
DOT Special Provisions (49 CFR 172.102):

8 - A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substances, liquid or solid, n.o.s.", as appropriate. In addition, for solid materials, special provision B54 applies.

146 - This description may be used for a material that poses a hazard to the environment but does not meet the definition for a hazardous waste or a hazardous substance, as defined in 171.8 of this subchapter, or any hazard class as defined in Part 173 of this subchapter, if it is designated as environmentally hazardous by the Competent Authority of the country of origin, transit or destination.

335 - Mixtures of solids that are not subject to this subchapter and environmentally hazardous liquids or solids may be classified as "Environmentally hazardous substances, solid, n.o.s." UN3077 and may be transported under this entry, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each transport unit must be leak-proof when used as bulk packaging.

A112 - Notwithstanding the quantity limits shown in Column (9A) and (9B) for this entry, the following IBCs are authorized for transportation aboard passenger and cargo-only aircraft. Each IBC may not exceed a maximum net quantity of 1,000 kg:

b. Rigid plastics: 11H1, 11H2, 21H1 and 21H2
c. Composite with plastic inner receptacle: 11HZ1, 11HZ2, 21HZ1 and 21HZ2
d. Fiberboard: 11G
e. Wooden: 11C, 11D and 11F (with inner liners)
f. Flexible: 13H2, 13H3, 13H4, 13H5, 13L2, 13L3, 13L4, 13M1 and 13M2 (flexible IBCs must be sift-proof and water resistant or must be fitted with a sift-proof and water resistant liner).

B54 - Open-top, sift-proof rail cars are also authorized.

IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).

N20 - A 5M1 multi-wall paper bag is authorized if transported in a closed transport vehicle.

TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.

DOT Packaging Exceptions (49 CFR 173.xxx)

155

DOT Quantity Limitations Passenger aircraft/rail
(49 CFR 173.27)

No limit

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)

No limit

DOT Vessel Stowage Location

A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.

Other information

No supplementary information available.

Transport by sea

Transport document description (IMDG)

UN 3077 Environmentally hazardous substances, solid, n.o.s. (Cupric sulfate pentahydrate), 9, III, MARINE POLLUTANT

UN-No. (IMDG)

3077

Proper Shipping Name (IMDG)

Environmentally hazardous substances, solid, n.o.s.

Class (IMDG)

9 - Miscellaneous dangerous substances and articles

Packing group (IMDG)

III - substances presenting low danger

EmS-No. (1)

F-A

EmS-No. (2)

S-F

Marine pollutant

Yes
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Air transport
Transport document description (IATA): UN 3077 Environmentally hazardous substances, solid, n.o.s. (Cupric sulfate pentahydrate), 9, III
UN-No. (IATA): 3077
Proper Shipping Name (IATA): Environmentally hazardous substances, solid, n.o.s.
Class (IATA): 9 - Miscellaneous Dangerous Goods
Packing group (IATA): III - Minor Danger

SECTION 15: Regulatory information

15.1. US Federal regulations
Copper (II) Sulfate, Pentahydrate (7758-99-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Subject to reporting requirements of United States SARA Section 313
RQ (Reportable quantity, section 304 of EPA’s List of Lists): 10 lb

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

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15.2. International regulations
CANADA
Copper (II) Sulfate, Pentahydrate (7758-99-8)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations
No additional information available

National regulations
Copper (II) Sulfate, Pentahydrate (7758-99-8)
Listed on the Canadian IDL (Ingredient Disclosure List)

15.3. US State regulations
California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Revision date: 05/02/2017
Other information: None.

Full text of H-phrases: see section 16:

<table>
<thead>
<tr>
<th>H-phrases</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H301</td>
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<td>H410</td>
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</tr>
</tbody>
</table>

NFPA health hazard: 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

NFPA fire hazard: 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity: 2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures.
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Hazard Rating

Health: 2 Moderate Hazard - Temporary or minor injury may occur

Flammability: 0 Minimal Hazard - Materials that will not burn

Physical: 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Personal protection

C - Safety glasses, Gloves, Synthetic apron

SDS US LabChem

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