Material Safety Data Sheet
Copper Sulfate - Hydrochloric Acid Solution

Section 1 - Chemical Product and Company Identification

MSDS Name: Copper Sulfate - Hydrochloric Acid Solution
Catalog Numbers: LC13450
Synonyms: None

Company Identification:
LabChem, Inc.
200 William Pitt Way
Pittsburgh, PA 15238

Company Phone Number: (412) 826-5230
Emergency Phone Number: (800) 424-9300
CHEMTREC Phone Number: (800) 424-9300 or 011-703-527-3887

Section 2 - Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric acid</td>
<td>5</td>
</tr>
<tr>
<td>7758-99-8</td>
<td>Copper sulfate, pentahydrate</td>
<td>18</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>balance</td>
</tr>
</tbody>
</table>

Section 3 - Hazards Identification

Emergency Overview

**Appearance:** Dark blue solution

**Danger:** Corrosive. Causes severe burns by all exposure routes. May be fatal if swallowed.

**Target Organs:** Respiratory and gastrointestinal systems, blood, kidneys, liver, teeth, eyes, skin

**Potential Health Effects**

**Eye:**
Causes severe eye burns.

**Skin:**
Causes severe skin burns.

**Ingestion:**
Causes severe digestive tract burns with nausea, vomiting, and diarrhea. May be harmful or fatal if swallowed.

**Inhalation:**
May cause severe irritation of the respiratory tract. May cause delayed lung edema.
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Chronic:
Prolonged or repeated skin contact may cause dermatitis, conjunctivitis, erosion of teeth, liver and kidney damage, anemia and other blood cell abnormalities. Individuals with Wilson’s disease are unable to metabolize copper. Thus, copper accumulates in various tissues and may result in liver, kidney, and brain damage. Laboratory experiments have resulted in mutagenic and reproductive toxicity effects.

Section 4 - First Aid Measures

Eyes:
Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids until no evidence of chemical remains. Get medical aid at once.

Skin:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid at once.

Ingestion:
Do not induce vomiting. Give conscious victim 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid at once.

Inhalation:
Move victim to fresh air immediately. If breathing is difficult, administer oxygen. Give artificial respiration if necessary. Get medical aid at once.

Notes to Physician:
Do NOT use sodium bicarbonate in an attempt to neutralize the acid. Do NOT use oils or ointments in eye.

Section 5 - Fire Fighting Measures

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Contact with metals may evolve flammable hydrogen gas. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media:
For small fires, use carbon dioxide, dry chemical, water spray, and alcohol-resistant foam.

Autoignition Temperature:
Not applicable.

Flash Point:
Not applicable.

NFPA Rating:
Health- 2, Flammability- 0, Instability- 0

Explosion Limits:
Lower:  n/a       Upper:  n/a

Section 6 - Accidental Release Measures
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General Information:
Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:
Absorb spill with inert material such as sand, vermiculite, or diatomaceous earth, and transfer to a suitable container labeled for later disposal. Label reclaimed spill material as corrosive and marine pollutant.

Section 7 - Handling and Storage

Handling:
Wash thoroughly after handling. Do not ingest or inhale. Do not get in eyes, on skin, or on clothing. Use with adequate ventilation.

Storage:
Store tightly capped in a cool, dry, well-ventilated area away from incompatible materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>2 ppm Ceiling</td>
<td>5 ppm Ceiling</td>
<td>5 ppm Ceiling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 mg/m3 Ceiling</td>
<td>7 mg/m3 Ceiling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 ppm IDLH</td>
<td></td>
</tr>
<tr>
<td>Copper sulfate pentahydrate</td>
<td>1 mg/m3 TWA (as Cu) (listed under Copper compounds, nos)</td>
<td>1 mg/m3 TWA (as Cu except Copper fume) (listed under Copper compounds, nos)</td>
<td>0.1 mg/m3 TWA (as Cu) (listed under Copper compounds, nos)</td>
</tr>
<tr>
<td>Water</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs:
Hydrochloric acid: 5 ppm Ceiling, 7 mg/m3 Ceiling

Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133. Do not wear contact lenses when working with chemicals.

Skin:
Wear appropriate protective gloves to prevent skin exposure.

Clothing:
Wear appropriate protective clothing to prevent skin exposure.

Respirators:
Follow the OSHA respirator regulations found in 29 CFR 1910.134. Always use a NIOSH-approved respirator when necessary.
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Section 9 - Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Blue</td>
</tr>
<tr>
<td>Odor</td>
<td>Pungent</td>
</tr>
<tr>
<td>pH</td>
<td>Strongly acidic</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>1.26</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Freezing/Melting Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Specific Gravity/Density</td>
<td>1.12</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Section 10 - Stability and Reactivity

**Chemical Stability:**
Stable under normal temperatures and pressures.

**Conditions to Avoid:**
Incompatible materials, excess heat.

**Incompatibilities with Other Materials:**
Strong oxidizing agents, bases, metals, reducing agents

**Hazardous Decomposition Products:**
Copper oxides, copper fumes, sulfur oxides (SOx), hydrogen chloride.

**Hazardous Polymerization:**
Will not occur.

Section 11 - Toxicological Information

**RTECS:**
CAS# 7758-99-8: GL8900000
CAS# 7647-01-0: MW4025000; MW4031000
CAS# 7732-18-5: ZC0110000

**LD50/LC50:**
CAS# 7758-99-8:
Oral, rat: LD50 = 300 mg/Kg
Dermal, rabbit: LD50 = 2000 mg/Kg
CAS# 7647-01-0:
Inhalation, rat: LC50 = 3124 ppm/1H
Oral, rabbit: LD50 = 700 mg/kg
Dermal, rabbit: LD50 = 5010 mg/kg
CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg
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Carcinogenicity:
None of the chemicals in this product are listed as a carcinogen by ACGIH, IARC, NTP, OSHA, or California Proposition 65.

Epidemiology:
No information available.

Teratogenicity:
Teratogenic effects have occurred in laboratory animals.

Reproductive:
Reproductive toxicity effects have occurred in laboratory animals.

Mutagenicity:
Mutagenic effects have occurred in laboratory animals.

Neurotoxicity:
No information available.

Section 12 - Ecological Information

Ecotoxicity:
In soil, copper sulfate is partly washed down to lower levels, partly bound by soil components, and partly oxidatively transformed. Copper has a strong affinity for hydrous iron and manganese oxides, clays, carbonate minerals, and organic matter. Sorption to these materials suspended in the water column and in the bed sediments results in relative enrichment of the solid phase and reduction in dissolved levels.

Environmental:
Copper is accumulated by plants and animals, but it does not appear to biomagnify from plants to animals. This lack of biomagnification appears common with heavy metals. In air, copper aerosols (in general) have a residence time of 2 to 10 days in an unpolluted atmosphere and 0.1 to >4 days in polluted, urban areas.

Physical:
No evidence was found to indicate that there is any biotransformation process for copper compounds which would have a significant bearing on the fate of copper in aquatic environments.

Other:
Severe marine pollutant.

Section 13 - Disposal Considerations
Dispose of in accordance with Federal, State, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: Hydrochloric acid
Hazard Class: 8
UN Number: UN1789
Packing Group: II

Section 15 - Regulatory Information
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US Federal
TSCA:
CAS# 7758-99-8 is not listed on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the Inventory (40CFR 720.3(u)(2)).
CAS# 7647-01-0 is listed on the TSCA inventory.
CAS# 7732-18-5 is listed on the TSCA inventory.

SARA Reportable Quantities (RQ):
CAS# 7758-99-8: 10 lb. final RQ; 4.54 Kg final RQ
CAS# 7647-01-0: 5000 lb. final RQ; 2270 kg final RQ

CERCLA/SARA Section 313:
This material contains Copper (II) sulfate pentahydrate (listed as copper compounds, n.o.s.), (CAS 7758-99-8, 18%), and Hydrochloric acid (CAS# 7647-01-0, 5%), which are subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

OSHA - Highly Hazardous:
CAS# 7647-01-0 is considered highly hazardous by OSHA.

US State
State Right to Know:
CAS# 7758-99-8 is listed on the following state right to know lists: California (listed as Copper compounds, nos), and Pennsylvania (listed as Copper compounds, nos).
CAS# 7647-01-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 7732-18-5 is not present on state lists from California, Pennsylvania, Minnesota, Massachusetts, Florida, or New Jersey.

California Regulations:
None.

European/International Regulations
Canadian DSL/NDSL:
CAS# 7758-99-8 is not listed on Canada's DSL or NDSL Lists.
CAS# 7647-01-0 is listed on Canada's DSL List.
CAS# 7732-18-5 is listed on Canada's DSL List.

Canada Ingredient Disclosure List:
CAS# 7758-99-8 is listed on the Canadian Ingredient Disclosure List (as Copper compounds, nos).
CAS# 7647-01-0 is listed on the Canadian Ingredient Disclosure List.
CAS# 7732-18-5 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Other Information

MSDS Creation Date: November 26, 2007
Revision Date: April 21, 2011

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