SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: COPPER SULPHATE (GREEN)
SDS Number: SDS-HG4065
Product Use: Industrial Use - Copper sulfate solution
Revised Date: 21 DECEMBER 2018

MANUFACTURER:

In America:
The Indium Corporation of America®
34 Robinson Rd., Clinton, NY 13323
Information: (315) 853-4900
nswarts@indium.com

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Asia-Pacific Operations-Singapore
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Singapore 628908
Information: +65 6268-8678

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Outside USA: +1 (703) 527-3887
In China: Emergency 86+ 4008417580

In China:
Indium Corporation (Suzhou), Co., Ltd.
No. 428 Xinglong Street
Suzhou Industrial Park
Suchun Industrial Square
Unit No. 14-C
Jiangsu Province, China 215126
Information: (86) 512-6283-4900

http://www.indium.com
2. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY: XEye XInhalation XSkin XIngestion NTP IARC OSHA XNot Listed

GHS

Signal Word: Danger

Hazard statement(s):
H314 Causes severe skin burns and eye damage
H318 Causes serious eye damage
H335 May cause respiratory irritation
H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s):
P233 Keep container tightly closed
P261 Avoid breathing dust/fume/gas/mist/vapors/spray
P270 Do not eat, drink or smoke when using this product
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face protection
P362 +P364 Take off contaminated clothing and wash before reuse
P301 + P314 IF SWALLOWED: Get Medical advice/attention if you feel unwell
P302 +P352 IF ON SKIN: Wash with plenty of soap and water
P304 + 341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
P305 + 351 IF IN EYES: Rinse continuously with water for several minutes (15 mins)

Classification:
Skin corrosion –Category 1B
Serious eye damage -Category 1
Specific target organ toxicity -single exposure -Category 3, respiratory system
Acute aquatic toxicity -Category 1
Chronic aquatic toxicity -Category 1

POTENTIAL HEALTH EFFECTS:

Eye Contact: Vapors may be irritating, liquid may damage eye tissue or cause burns.

Ingestion: May result in gastric disturbances such as nausea and vomiting.

Inhalation: May cause throat irritation or burns.

Skin Contact: May cause irritation or burns.

Chronic: Not established. Copper sulfate target organ effect: liver, kidney, blood.

NOTE: The Indium Corporation does not recommend, manufacture, market or endorse any of it's products for human consumption.
3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>% wt</th>
<th>CAS Registry #/EINECS#</th>
<th>PEL</th>
<th>TLV-TWA</th>
<th>TLV-STEL</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>mg/m³</td>
<td>mg/m³</td>
<td>mg/m³</td>
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<tr>
<td>COPPER SULFATE</td>
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<td>7758-98-7/231-847-6</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0.2(fume)</td>
<td>1(dust)</td>
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<td>(as copper)</td>
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<tr>
<td>(US)</td>
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<td>(EU)</td>
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<td>(Canada)</td>
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<tr>
<td>(Singapore)</td>
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<tr>
<td>(Mexico)</td>
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<tr>
<td>HYDROCHLORIC ACID</td>
<td>25-35</td>
<td>47647-01-0/231-595-7</td>
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<tr>
<td>(EU)</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>8(gas/mist)</td>
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<td>(Singapore)</td>
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<td></td>
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<td></td>
<td>7.5</td>
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<tr>
<td>(Mexico)</td>
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<td></td>
<td>7</td>
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<tr>
<td>(China)</td>
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<td></td>
<td></td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>SOLVENT(water)</td>
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<td>7732-18-5</td>
<td>N.E.</td>
<td>N.E.</td>
<td>N.E.</td>
</tr>
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</table>

N.E. = Not established

4. FIRST AID MEASURES

Eye Contact: Hold eyelids apart and flush eyes with plenty of tepid water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: If patient is conscious, ONLY induce vomiting as directed by trained personnel. NEVER give anything by mouth to an unconscious person. Seek medical attention immediately.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration or oxygen by trained personnel. Seek immediate medical attention.

Skin Contact: Remove contaminated clothing. Wash affected area with soap and water. Wash clothing before reuse. If irritation persists, obtain medical attention.

5. FIRE FIGHTING MEASURES

Flash Point: N/A Method:

Auto-ignition Temperature: NA

Flammable Limits: NA

Extinguishing Media: Water. Use extinguishers appropriate for the surrounding fire conditions.

Special Fire Fighting Procedures: Standard fire fighting equipment when fighting fire with toxic corrosive fumes.
6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: DO NOT allow material to enter sewer system or waterway. Wear personal protective equipment, such as gloves and depending on the quantity a respirator with acid vapor cartridges may be required. Clean up by absorption or neutralization. Keep unnecessary personnel away. Put clean-up materials in a properly labeled plastic/poly drum. Dispose of following all Federal, State and Local regulations. In the EU refer to the Special Waste Regulations.

7. HANDLING AND STORAGE

Handling Precautions: Keep containers tightly closed when not in use. Use care to avoid spills. Wear personal protective equipment.

Storage Precautions: Store product in tightly capped original containers in a cool, dry area. Refer to product label for specific storage temperature requirements. Rotate stock to ensure use before expiration date on the label.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Face velocity >2.1 cubic feet/minute in confined areas. Exhaust ventilation is recommended to keep exposure limits as low as possible. Use ventilation.

Personal protection:

Eyes: Chemical safety glasses/goggles. Face shield for splash hazards.

Respirator: An authority approved or compliant marked air-purifying respirator with a acid vapor chemical cartridge is recommended where airborne concentrations are expected to be elevated.

Skin: Compatible chemical resistant gloves for handling acids.

Other: Lab coat, eyewash fountain/shower unit in work area. Avoid the use of contact lenses.

Work/Hygienic Practices: Maintain good housekeeping. Clean up spills immediately. Good personal hygiene is essential. Avoid eating, smoking or drinking in the work area. Wash hands thoroughly with soap and water immediately upon leaving the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Green</td>
</tr>
<tr>
<td>Odor</td>
<td>Sharp pungent</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.160 @60°F</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>ND</td>
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<tr>
<td>Vapor Density</td>
<td>ND</td>
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<tr>
<td>Volatile by Volume</td>
<td>80%</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>212°F</td>
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<tr>
<td>Melting Point</td>
<td>N/A</td>
</tr>
<tr>
<td>pH</td>
<td>0.68</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>&lt;1</td>
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</tbody>
</table>

10. STABILITY AND REACTIVITY

General: Stable.

Conditions to Avoid: Direct heat, open flames.
11. TOXICOLOGICAL INFORMATION

Carcinogenicity:
- NTP: No
- OSHA: No
- IARC: No

LD50: Not established.  LC50: Not established.

Copper sulphate:
- LD50 Oral Rat rat – 300 mg/kg
- LD50 Intraperitoneal – rat – 20mg/kg
- LD50 Subcutaneous – rat – 43 mg/kg
- Genotoxicity in vitro – rat – liver DNA damage

Signs and Symptoms of Exposure
Copper poisoning (systemic) may include: capillary damage, headache, cold sweat, weak pulse and kidney and liver damage. Chronic copper poisoning is typified by hepatic cirrhosis, brain damage and kidneys defects and copper deposition in the cornea as exemplified by humans with Wilson’s disease. To the best of our knowledge the chemical, physical and toxicological properties of copper have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

Product not tested.

Copper sulfate: toxicity to fish – mortality LC50 – other fish – 1.0-2.5 mg/l – 96h

Copper sulfate: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATION

Waste Disposal Method: Dispose of in accordance with all Federal, State and Local environmental regulations. In Europe follow the Special Waste Regulations.

14. TRANSPORT INFORMATION

Transport in accordance with applicable international regulations and requirements.

UN3264, Corrosive Liquid, acidic, inorganic, N.O.S., 8, PGIII (hydrochloric acid, copper sulfate)


Reportable quantity Copper Sulfate: 10 lbs. If shipping amounts exceed this RQ must be added to in front of the name. Note product contains approx 20% copper sulfate. Calculate shipping quantity to determine proper name.
IMDG:
RQ, UN3264, Corrosive Liquid, acidic, inorganic, N.O.S., 8, PGIII (hydrochloric acid, copper sulfate) (Marine Pollutant) (Copper Sulfate)

Copper Sulfate is listed as a Severe Marine Pollutant. Follow applicable shipping rules and markings.

15. REGULATORY INFORMATION

The information in this Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated hereunder (29 CFR 1910.1200 ET. SEQ.).

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation (CPR).

Canadian WHMIS: Class E Corrosive

This product has been classified in accordance with the guidelines set by the Dept of Industrial Health of the Republic of Singapore.

Malaysia:
This product has been classified in accordance with: Malaysian – OCCUPATIONAL SAFETY AND HEALTH (CLASSIFICATION, LABELING AND SAFETY DATA SHEET OF HAZARDOUS CHEMICALS) REGULATION OCTOBER 2013 – (CLASS). (GHS)

In China:
Decree No. 591: Regulations on the Control over Safety of Hazardous Chemicals
GB 30000.2-29-2013, Rules for classification and labeling of chemicals. (GHS)
GB/T 16483-2008, GB/T 17517-2013
This product has been classified using the Chinese Occupational Limit for Hazardous Agents in the Workplace, GBZ2-2007.

This product has been classified in accordance with the Mexican guidelines, NOM-018-STPS-2015 and NOM-010-STPS-2014.

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

SARA 313 Listing - 40 CFR 372.65: Copper CAS#7440-50-8

All ingredients are listed on the EPA TSCA Inventory.
Superfund Reportable Quantity (RQ): 10lbs Copper Sulfate (CuSO₄)
16. OTHER INFORMATION

HMIS Hazard Rating:
- Health: 2
- Fire: 1
- Reactivity: 0

Revised Date: 21 DECEMBER 2018
Prepared by: Nancy Swarts, Indium Corporation of America

The information and recommendations contained herein are, to the best of The Indium Corporation of America's knowledge and belief, accurate and reliable as of the date issued. The Indium Corporation of America does not warrant or guarantee their accuracy or reliability, and The Indium Corporation of America shall not be liable for any loss or damage arising out of the user thereof. The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container.