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Current Version: 1.0  
Revision Date: Apr 19, 2016

## Material Safety Data Sheet

Identity: Copper (II) sulfide

Formula: CuS

### SECTION I - GENERAL INFORMATION

Manufacturer: Advanced Engineering Materials Limited (AEM)

The information below is believed to be accurate and represents the best information available to AEM. However, AEM makes no warranty, expressed or implied with respect to such information and assumes no liability resulting from its use.

### SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

CAS #	OSHA PEL	ACGIH TLV	%
1317-40-4	0.1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	0.0-100.0%

### SECTION III – PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: 220°C

Vapor Pressure (vs. air or mmHg): N/A

Melting Point: 103°C

Density at 20°C (68°F): 3.9 - CuSe 4.6 g/cm<sup>3</sup>

Evaporation Rate: N/A

Flash Point: N/A

Solubility in water: Insoluble

Specific gravity (water = 1): N/A

*Appearance and odor:* Black powder and pieces, no odor

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

*Method Used:* Unknown

*Explosive Limits:* LEL: N/A

UEL: N/A

*Extinguishing Media:* Use suitable extinguishing agent for surrounding material and type of fire

*Special Fire Fighting Procedures:*

Firefighters must wear full face, self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

*Unusual Fire and Explosion Hazards:*

–When heated to decomposition, copper sulfide may emit oxides of sulfur and copper.



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- Explodes on contact with magnesium chlorate, zinc chlorate, cadmium chlorate or concentrated solutions of chloric acid.
- Can react violently with  $H_2O_2$ ,  $NH_4MgNO_3 + water$ ,  $Zn(ClO_3)_2$ .
- Stable in air when dry, oxidized to  $CuSO_4$  by moist air.

## SECTION V - REACTIVITY DATA

*Stability:* Stable under recommended storage conditions

*Conditions to Avoid (instability):* None

*Incompatibility:* Magnesium chlorate, zinc chlorate, cadmium chlorate, chloric acid,  $H_2O_2$ ,  $NH_4MgNO_3 + water$ ,  $Zn(ClO_3)_2$ , moisture.

*Hazardous Decomposition or Byproducts:* Oxides of sulfur and copper.

*Dangerous products of decomposition:* Sulfur dioxide, hydrogen sulfide, metal oxide fume.

*Hazardous Polymerization:* Will not occur.

*Conditions to avoid (hazardous polymerization):* None.

## SECTION VI - HEALTH HAZARD DATA

*Routes of entry:* Inhalation? Yes      Skin? Yes      Eyes? Yes  
   Ingestion? Yes      Other? No

Copper compounds: In animals, inhalation of copper dust has caused hemolysis of the red blood cells, deposition of hemofuscin in the liver and pancreas, and injury to the lung cells; injection of the dust has caused cirrhosis of the liver and pancreas, and a condition closely resembling hemochromatosis or bronzed diabetes. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Sulfides of the heavy metals are generally insoluble and hence have little toxic action except through the liberation of hydrogen sulfide. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

### Signs and Symptoms of Overexposure:

*Inhalation:* May cause a red, dry throat, metallic taste in mouth, congestion of the nasal and pharyngeal, sneezing, headache, excitability, dizziness and difficulty breathing.

*Ingestion:* Acute copper toxicity may cause: fever, tachycardia, hypotension, hemolytic anemia with intravascular hemolysis, oliguria, uremia, coma and cardiovascular collapse. Chronic copper toxicity may cause: nausea, vomiting, epigastric pain, yellow watery diarrhea, dizziness, general debility, jaundice, and green stools, saliva and vomitus.

*Skin:* May cause redness, itching and swelling.

*Eye:* May cause redness, itching, burning and watering.



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## Health Hazards (Acute and Chronic):

### *Inhalation:*

Acute: May cause metallic taste, congestion of nasal mucous membranes, and irritation to respiratory tract.

Chronic: May cause ulceration and perforation of the nasal septum and pharyngeal congestion

### *Ingestion:*

Acute: Poison by intraperitoneal route. May cause acute copper toxicity

Chronic: Irritation to the gastrointestinal tract and damage to nervous system, kidneys and enlargement of liver

### *Skin:*

Acute: May cause irritation.

Chronic: May cause dermatitis.

### *Eye:*

Acute: May cause irritation to the conjunctivae

Chronic: None recorded

*Target Organs:* May affect respiratory system, skin, liver, central nervous system and kidneys

*Carcinogenicity:* NTP? No      IARC Monographs? No      OSHA Regulated? No

*Medical Conditions Aggravated by Exposure:* Pre-existing respiratory and gastric disorders and increased risk for individuals with Wilson's disease

## Emergency and First Aid Procedures:

*Inhalation:* Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention.

*Ingestion:* Give 1-2 glasses of milk or water and induce vomiting, seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

*Skin:* Remove contaminated clothing, brush material off skin, wash affected area with mild soap and water, and seek medical attention if symptoms persist.

*Eye:* Flush eyes with lukewarm water, lifting upper and lower eyelids for at least 15 minutes and seek medical attention.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE
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### *Steps to be taken in case material is released or spilled:*

Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area, provide ventilation and extinguish sources of ignition. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

### *Waste disposal method:*

Dispose of in accordance with state, local, and federal regulations.



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*Hazard Label Information:*

Store in cool, dry area and in tightly sealed container. Wash thoroughly after handling.

SECTION VIII - CONTROL MEASURES
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*Protective Equipment Summary (Hazard Label Information):*

NIOSH approved respirator, impervious gloves, safety glasses, clothes to prevent contact.

*Ventilation:*

Local Exhaust: To maintain concentration at low exposure levels.

Mechanical (General): Recommended.

*Work/Hygienic/Maintenance Practices:*

Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air.

Please be advised that N/A can either mean Not Applicable or No Data Has Been Established
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