1. Product and Company Identification

**Trade / Commercial Name**
COPPER SULPHATE

**Chemical Name**
Copper Sulphate

**Formula**
CuSO4

**Chemical Family**
029 Copper compounds 016 Sulphates

**Synonyms**
Cuprous Sulphate, Cupric Sulphate, Blue Vitriol

**CAS No**
7758-99-8

**Date Issued**
2013/10/07

**Company Details**

<table>
<thead>
<tr>
<th>Name</th>
<th>PROTEA CHEMICALS</th>
<th>Emergency Tel</th>
<th>0800 172 743</th>
</tr>
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<tbody>
<tr>
<td>Address</td>
<td>1 Berrange Road</td>
<td>Tel</td>
<td>011 821 3300</td>
</tr>
<tr>
<td></td>
<td>Wadeville</td>
<td>Fax</td>
<td>011 827 4612</td>
</tr>
<tr>
<td></td>
<td>Germiston</td>
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</table>

2. Hazards Identification

Highly toxic
Severe poisoning, perhaps fatal: by absorption through skin, by inhalation, by ingestion.
Decomposition in a fire: production of toxic fumes. The effect of inhalation may be delayed.

3. Composition

**Hazardous Components**
Copper Sulphate

4. First Aid Measures

**First Aid Skin**
Remove & isolate contaminated clothing and shoes.
For minor skin contact, avoid spreading material on unaffected skin.
Flush body with plenty of water for at least 20 minutes. Keep warm and quiet.

**First Aid Eyes**
Flush eyes with water for 20 minutes.
Hold eyelids open while washing.

**First Aid Ingested**
Seek medical treatment.

**First Aid Inhalation**
Move victim to fresh air. If not breathing give artificial respiration.
Do not use mouth-to-mouth, if victim has inhaled or ingested the substance; induce artificial respiration with the aid of a pocket mask with a one-way valve.
If breathing of victim is difficult administer oxygen. Effects of exposure may be delayed.

5. Fire Fighting Measures

Small Fires: Dry chemical, CO2 or water spray.
Large Fires: Water spray, fog or regular foam. Move containers from fire area if you can do it without risk.
Dike fire control water for later disposal; do not scatter the material. Do not use straight streams.
Fire involving Tanks or Bulk Containers: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
Do not get water inside containers. ALWAYS stay away from the ends of tanks.
Cool containers with flooding quantities of water until well after fire is out.
Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
Isolate spill or leak area immediately for at least 25 to 50 metres (80 to 160 feet) in all directions.
Keep unauthorized personnel away. Stay upwind. Keep out of low areas.
Wear positive pressure self-contained breathing apparatus (SCBA).
Wear chemical protective clothing which is specifically recommended by the manufacturer.
Structural firefighters' protective clothing is recommended for fire situations ONLY; it is not effective in spill situations.
If ROAD OR RAIL TANKER is involved in a fire, ISOLATE for 800 metres (1/2 mile) in all directions; also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

6. Accidental Release Measures

Full protective clothing including breathing apparatus
Contain (avoid spillage from entering drains or water courses)
PRECAUTIONS:
Restrict access to area.
Provide adequate protective equipment and ventilation.
Remove sources of heat and flame.
Notify occupational and environmental authorities.
SPILL OR LEAK:
Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
Stop leak if you can do it without risk.
Prevent entry into waterways, sewers, basements or confined areas.
Cover with plastic sheet to prevent spreading.
DO NOT GET WATER INSIDE CONTAINERS.

7. Handling And Storage

Separation of at least 3M from the following classes is recommended.
Corrosives
Fire separation of at least 5M or 4Hr fire resistant wall
from the following classes is recommended.
Flammable Gases, Flammable Liquids.
Flammable Solids, Spontaneously Combustibles
Dangerous When Wet Oxidizing Agents
Storage in the same room or space is prohibited with the following classes:
Explosives, Organic Peroxides
The rooms or spaces should be at least 10M apart.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits

Exposure Limits:
TWA: 1 (mg/m³) from ACGIH (TLV) [United States] Inhalation TWA: 0.1
(mg/m³) from OSHA (PEL) [United States] Inhalation
TWA: 1 (mg/m³) from NIOSH Inhalation Consult local authorities for acceptable
exposure limits.

Controls
The control measures appropriate for a particular worksite depend
on how this material is used and on the extent of exposure.
The best protection is to enclose operations and/or provide
local exhaust ventilation at the site of chemical release.
Use a non-sparking, grounded ventilation system separate from other
exhaust ventilation systems. Exhaust directly to the outside.
Supply sufficient replacement air to make up for air removed.
Have a safety shower/eye wash fountain readily available in the immediate work
area

Personal Protection
If engineering controls and work practices are not effective in
controlling this material, then wear suitable personal protection
equipment, including chemical safety goggles & face shield, boots,
imperious gloves, coveralls, & respiratory protection.
Have appropriate equipment available for use in emergencies.

9. Physical & Chemical Properties

Blue crystals packed in plastic bags.
Blue crystals or bluish-white powder slowly efflorescing in air, white
when dehydrated, odourless.
Solubility: In water: 31 g/100 ml water at 0 oC.
Melting Point: 110 oC.
Density: 2.3 g/cm³

**10. Stability And Reactivity**

<table>
<thead>
<tr>
<th>Conditions to Avoid</th>
<th>Stable at room temperature.</th>
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</thead>
<tbody>
<tr>
<td><strong>Incompatible Materials</strong></td>
<td>Solution of copper(2+) sulfate is an acid. Incompatible with strong bases, Alkali's hydroxylamine, magnesium etc</td>
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<tr>
<td><strong>Other</strong></td>
<td>Oxides of sulfur, copper fumes. Aqueous solutions are slightly acidic.</td>
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</table>

**11. Toxicological Information**

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD₅₀): 300 mg/kg [Rat.]. Acute dermal toxicity (LD₅₀): >2000 mg/kg [Rat.].

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. May cause damage to the following organs: kidneys, liver.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 1088 mg/kg

Special Remarks on Chronic Effects on Humans: May affect genetic material based on animal data

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. May cause skin burns. It may cause and itching allergic eczema. Eyes: Causes eye irritation. May cause eye burns. It may cause conjunctivitis, corneal discoloration, ulceration and turbidity of the cornea. Inhalation: Causes respiratory tract (nose, throat, lung) irritation with coughing and wheezing. May cause ulceration and perforation of the nasal septum if inhaled in excessive quantities. Burning copper sulfate may result in irritating and poisonous gases which may irritate the respiratory tract and lungs, and may cause fume metal fever which is characterized by flu-like symptoms such as fever, chills, muscle aches. Ingestion: Harmful if swallowed. May cause gastrointestinal tract irritation with nausea, vomiting, diarrhea, metallic taste, burning sensation in the stomach or epigastrium, abdominal pain, and possible gastrointestinal tract bleeding. May affect metabolism (metabolic acidosis), liver (liver damage, jaundice), blood (Methemoglobin, hemolytic anemia), urinary system (kidney damage, hematuria, hemoglobinuria, albuminuria), behavior/nervous systems (somnolence, tremor, psychosis, muscle weakness, coma), cardiovascular system (lowering of blood pressure, dysthrythmia). Oral mucosa, vomitus, stools, and saliva may be stained blue or green following ingestion. Aspiration pneumonia may develop following emesis and CNS depression. Chronic Potential Health Effects: Skin:
Repeated or prolonged skin contact may cause thickening of the skin.

**12. Ecological Information**

Ecotoxicity:
Ecotoxicity in water (LC₅₀): 0.1 ppm 48 hours [Goldfish]. 0.1 mg/l 96 hours [Rainbow Trout]. 2.5 mg/l 96 hours [Rainbow Trout].

BOD₅ and COD: Not available.

Products of Biodegradation:
p. 5

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation:
If released to soil, copper sulfate may leach to groundwater, be partly oxidized, or bind to humic materials, clay, or hydrous iron and manganese. In water, it will bind to carbonates as well as humic materials, clay and hydrous oxides of iron and manganese. 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 in a polluted, urban areas.

**13. Disposal Considerations**
Disposal Method Product

There are no uniform EC regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. The disposal of the latter is regulated in the EC member countries through corresponding laws and regulations. We recommend that you contact the authorities in charge or approved waste disposal companies which will advise you on how to dispose of special waste.

Disposal Method Packaging

Disposal in accordance with local legal provisions.

14. Transport Information

<table>
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<tr>
<th>UN No</th>
<th>ERG No</th>
<th>Hazchem Code</th>
<th>IMDG-Code</th>
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15. Regulatory Information

EEC Hazard Classification 6.1

Risk Phases

R24 Toxic in contact with skin.
R25 Toxic if swallowed.
R50 Very toxic to aquatic organisms.
R53 May cause long-term adverse effects in the aquatic environment.

Safety Phases

S20 When using, do not eat or drink.
S37 Wear suitable gloves.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)
S60 This material and its container must be disposed of as hazardous waste.
S61 Avoid release to the environment. Refer to special instructions / safety data sheets.

16. Other Information

Reason for Alteration: General update.

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properness of the product.

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