1. PRODUCT AND COMPANY IDENTIFICATION

Trade Name: KOCIDANE
Product Name: Cupric hydroxide 77% WP
Chemical Name: copper hydroxide
Common Name: Cupric hydroxide
Chemical Family: Inorganic salt
Chemical Formula: Cu(HO)2
Molecular weight: 97.54
Approved Use: Foliar fungicide with protective action.
Supplier: SHANGHAI KELINON AGROCHEMICAL CO., LTD.
Emergency phone No: +86-21-65750731
Issued By: SHANGHAI KELINON AGROCHEMICAL CO., LTD.

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>CAS No.</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cupric hydroxide</td>
<td>20427-59-2</td>
<td>770 g/Kg (a.i.) (copper equivalent: 500 g/kg)</td>
</tr>
<tr>
<td>2.</td>
<td>Inerts</td>
<td></td>
<td>Balance</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Likely routes of exposure:
Direct contact may seriously damage eye tissue. Slightly to non-toxic orally, dermally, and by inhalation. See below for route-specific details.
POTENTIAL HEALTH EFFECTS:

**Inhalation:** Slightly toxic by inhalation. Excessive exposure may cause cough, mucous production, shortness of breath, reflecting metal fume fever.

**Eye irritation:** Severely irritating to the eyes. Direct contact may cause destruction of eye tissue. May be corrosive to the eyes if not washed immediately.

**Skin irritation:** Slight skin irritant. Excessive exposure, especially if prolonged, may produce skin irritation. Repeated exposure may cause allergic contact dermatitis.

**Skin absorption:** Not a skin absorption hazard.

**Ingestion:** Slightly toxic by oral exposure. This material may produce toxicity if ingested in large quantities. Symptoms of over-exposure may include nausea and vomiting, abdominal pain, and central nervous system depression.

**Chronic:** Low chronic toxicity unless excessive exposure is encountered. Excessive exposure to copper by inhalation may result in irritation of the upper respiratory tract which, if severe, may lead to perforation of the nasal septum after long periods of exposure.

4. FIRST-AID MEASURES

**Inhalation:**
Remove victim to fresh air. If not breathing, give artificial respiration preferably mouth-to-mouth. Get professional medical attention immediately.

**Skin contact:**
Remove contaminated clothing and shoes. Wash with plenty of soap and water for 15 to 20 minutes until no evidence of chemical remains. Get professional medical attention immediately.

**Eye contact:**
Hold eyelids open and flush with water for 15 to 20 minutes until no evidence of chemical remains. Get professional medical attention immediately.

**Ingestion:**
Drink promptly a large quantity of milk, egg white, gelatin solution or if these are not available, large quantities of water. Unless extensive vomiting has occurred, empty the stomach by gastric lavage with water, milk, sodium bicarbonate solution of a 0.1 % solution of potassium ferrocyanide. (Gosselin, Clinical Toxicology of commercial Products, 5th edition.). Administration of gastric lavage should be performed by qualified medical personnel. Probable mucosal damage may contra-indicate use of gastric lavage.

**Emergency Medical Treatment:**
Treat symptomatically. Acute oral overexposure to copper hydroxide, a major component of this product, may cause hypertension, hemolysis, and, rarely methemoglobinemia. Severe intoxication is associated with serum copper levels greater than 500 mcg/dl. Copper hydroxide is an emetic, however, dilution with fluids, adsorption with activated charcoal, or lavage may be indicated. Chelation therapy with BAL or D-penicillamine has proved useful in cases of acute overexposure.

5. FIRE-FIGHTING MEASURES

**Fire and explosion hazard:**

- **General Hazard:** Negligible fire hazard when exposed to heat or flame.
- **Extinguishing agents:** Use dry chemical, carbon dioxide, water spray or foam. No incompatible fire fighting media known.
- **Fire fighting Instructions:** Avoid contact with molten product to prevent serious burns.
- **Fire fighting Equipment:** Wear protective clothing and self-contained breathing apparatus.
- **Hazardous Combustion Products:** Decomposes to CuO and H2O above 140 OF

6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:**
Avoid contact with skin and eyes. Do not breathe in fumes.

**Land spill:** Sweep up and place in suitable (fireboard) containers for later disposal. **Water spill:** If feasible, copper may be precipitated/ultra-filtrated with caustics or other chemicals and resulting sludge disposed of in a...
Environmental precautions:
Do not allow entering drains or watercourses. Spillage or uncontrolled discharges into water courses (or public waters) to be reported immediately to the Police and to the Department of Water/Environmental Affairs.

Occupational spill:
Do not touch spilled material; stop leak if you can do it without risk. Keep out unprotected persons and animals.

7. HANDLING AND STORAGE

Storage temperature: Store below 35 °C. Average shelf life under proper storage conditions is 2 years. Storage Pressure: Ambient pressure.
General Information: Store is a clean, dry area. Do not store near feed, food or within the reach of children.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Pesticide Applicators & Workers:
It is essential to provide adequate ventilation. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. Ensure that control systems are properly designed and maintained. Comply with occupational safety, environmental, fire, and other applicable regulations.

PERSONAL PROTECTIVE EQUIPMENT:
If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection.

Ventilation:
Control enclosed spaces with adequate ventilation. Prevent exceeding of 1 mg/m³ (ACGIH TLV or OSHA PEL).

Respirator:
An approved respirator suitable for protection from dusts and mists of pesticides is adequate. Limitations of respirator use specified by the approved agency and the manufacturer must be observed.

Clothing:
Employee must wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact with this substance. Wear long sleeved shirt, long pants, waterproof gloves and shoes plus socks.

Eye protection:
Wear protective eyewear to prevent contact with this substance.
Emergency eye wash: Where there is any possibility that an employee’s eyes may be exposed to this substance, the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Light blue fine powder.
Odour: Characteristic copper odour.
Bulk Density: 0,19 to 0,26 g/cc.
Flash point: None
Melting point: Decomposes at 140 °C
pH: 6 ~ 9
Solubility in water: Disperses to form a suspension. Cupric hydroxide is insoluble in cold water and decomposes in hot water.

10. STABILITY AND REACTIVITY

Stability: Stable for up to 2 years under normal warehouse storage conditions.
Conditions to Avoid: Avoid excessive heat and moisture.
Incompatible materials: Not determined.
11. TOXICOLOGICAL INFORMATION

FORMULATED PRODUCT:

Acute oral LD50: Male rats: 943 mg/kg; Female rats: 846 mg/kg
Acute dermal LD50: > 2 000 mg/kg in rabbits; > 5 000 mg/kg in rats.

Inhalation: LC50 = 1,53 mg/l for male rat (4 hour); LC50 = 1,04 mg/l for female rat (4 hour). LC50 = 11,65 mg/l for rat (1 hour). May cause irritation of the mucous membranes. Exposure to copper fume may result in metallic taste, nausea, vomiting, and metal fume fever with chills, fever, aching muscles, dry throat and headache.

Acute skin irritation: May cause slight irritation. Many copper salts cause itching, eczema and rarely sensitisation reactions in previously exposed persons.

Acute eye irritation: Severely irritating to the eyes. May cause severe eye irritation including permanent corneal opacity. May be corrosive to the eyes if not washed immediately.

Skin absorption: This product is slightly toxic by dermal exposure.

Ingestion: LD50 indicating slight toxicity. Ingestion of large doses of copper salts may result progressively in irritation of the gastrointestinal tract, nausea, vomiting, salivation, gastric pain, hemorrhagic gastritis, diarrhea, capillary damage, liver and kidney damage and central nervous system stimulation followed by depression. Jaundice, pain in the liver, and haemolytic anemia have been reported following acute human poisonings.

Chronic: Repeated ingestion of copper salts may results in anemia, liver and kidney damage. Chronic inhalation exposure may cause a metallic taste in the mouth, irritation of the upper respiratory tract such as the nasal mucosa that may progress to perforation of the nasal septum. Chronic cough may also occur. Copper hydroxide which comprises 77% of this product governs the toxicity of the product. The remaining components have low to negligible toxicity.

Special Health Effects: Copper-intolerant individuals should not be exposed to this material. No additional information is available on whether overexposure to this material would aggravate other existing special medical conditions.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGY:
The degree of mobility of copper in the environment depends upon the pH of ambient soils and waters. The higher the acidity, the more soluble copper salts are and hence, the more mobile. Partitioning of copper into air is negligible due to the low vapour pressure of copper salts.

Birds:
- Acute oral LD50: Bobwhite quail > 340 mg/kg
- 8-day dietary LD50: Bobwhite quail > 10 000 ppm
- 8-day dietary LD50: Mallard duck > 10 000 ppm

Fish:
- LC50: Rainbow trout: 23 ppb
- LC50 (96 h): Fathead minnow: 23 ppb
- LC50: Bluegill sunfish: 180 000 ppb

Bees: Non-toxic to honeybees.

Daphnia: EC50: 6.5 ppb

13. DISPOSAL CONSIDERATIONS

Product and Waste: Waste and contaminated material from minor spills may be disposed of by burying in a safe place away from water supplies on non-crop land. Dilute surplus of spray mixture with plenty of water and broadcast it on non-crop areas.
Containers: Do not reuse containers. Crush or bury containers or dispose of in accordance with all local regulations.

14. TRANSPORT INFORMATION

UN NUMBER: NOT REGULATED
ADR/IRD: NOT REGULATED
IMDG/IMO: NOT REGULATED
ICAO/IATA: NOT REGULATED
DOT SHIPPING NAME: Agricultural Fungicide N.O.S.

DOT has determined that this material is not subject to hazardous materials in commerce transport regulations (HMR: 49 CFR Parts 171 – 180).

15. REGULATORY INFORMATION

Symbol: Xi, Irritant
Risk phrases:
R 22 harmful if swallow
R 36/38 Irritating to eyes and skin.
R 41 Risk of serious damage to eyes.
Safety phrases:
S 1/2 Keep locked up and out of the reach of children.
S 22 Do not breathe dust.
S 24/25 Avoid contact with skin and eyes.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 46 If swallowed, seek medical advice immediately and show this container and label.

16. OTHER INFORMATION

Packing: In 1, 5, 10, 20 & 25 kg multi-lined paper bags, aluminium-bags, or as per request.

Revision Date Prepared: 11/12/2014

DISCLAIMER

The information in the MSDS relates to this specific material. If the product is used as a component in any other product, this MSDS may not be valid. The information contained was obtained from sources which we believe are reliable. The information is provided without any warranty, expressed or implied, regarding its correctness.
This Material Safety Data Sheet was prepared according to Directive 93/112/EEC.