CUPROUS OXIDE
TECHNICAL GRADE

Material Safety Data Sheet

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SECTION 1: IDENTIFICATION OF PRODUCT

Product Name: **Technical Grade Cuprous Oxide**

SECTION 2: COMPOSITION OF / INFORMATION ON INGREDIENTS

Chemical Name	:	Copper oxide (I)
Chemical Formula	:	Cu_2O
Synonyms	:	Cuprous oxide, red Copper Oxide
CAS Number	:	1317-39-1
UN Number	:	3077

SECTION 3: HAZARDS IDENTIFICATION

Markings on label	:	Class 9, NCh 382 of 2004
Chemical Product Hazard Classification	:	Toxic substance if swallowed or inhaled; Class III, slightly hazardous. SAG Resolution 2196.

a) Hazard to people's health

Effects of acute over-exposure (one time only):
Symptoms may appear to be similar to those relating to acute ingestion.

Inhalation:
May cause irritation of respiratory tract; symptoms may include coughing, sore throat and breathing difficulties. Inhalation may result in ulceration and perforation of the respiratory tract. When heated, this compound may release copper fumes that can cause symptoms similar to those of a common cold, including chills and head heaviness.

Skin contact:
Product causes skin irritation. Symptoms include reddening, itching and pain.

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Eye contact:
May cause eye irritation and possible conjunctivitis. Contact causes irritation and may cause conjunctivitis, ulcers or cornea cloudiness.

Ingestion:
Abdominal pain, nausea, vomiting, diarrhoea and salivation.

Effects of chronic over-exposure (long-term):
Not available.

Medical conditions that will be aggravated with exposure to product:
Asthma and respiratory problems, sensitive skin.

b) Hazards to the environment

Potential contamination risks are minor if product is used in the recommended dosages and applied properly.

c) Special product hazards:

None known**.**

SECTION 4: FIRST AID MEASURES

In case of accidental contact with product, proceed as follows:

Inhalation:
Move to open air. If victim is not breathing, administer artificial respiration. If breathing becomes difficult, administer oxygen. Seek medical help immediately.

Skin contact:
Remove contaminated clothing and wash affected area with abundant water and soap, for at least 15 minutes. If irritation persists, repeat washing. Seek medical help.

Eye contact:
Flush eyes with abundant water for at least 15 minutes. Lift and separate eyelids to ensure product removal. If irritation persists, repeat flushing. Seek medical help.

Ingestion:
Rinse mouth with water. Induce vomiting immediately, supervised by medical personnel. If victim is unconscious, DO NOT give anything by mouth. Seek medical help immediately.

Notes to treating physician:
No specific antidote against this product is known; apply symptomatic therapy. Administer activated carbon, as needed (effectiveness is debated). If breathing becomes difficult, administer oxygen.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Agents:
Fire is not considered a risk. Use any appropriate means to extinguish surrounding fire. The majority of the extinguishing agents can be used. Apply indirectly, in order to avoid spreading of bulk product and cause particles to be suspended in the air.

Special fire-fighting procedures:
Keep containers exposed to fire cool by sprinkling water. Avoid using water jets and contain flowing water with temporary barriers, for instance, dirt.

Fire-fighting personal protection equipment:
Use adequate protection clothing and self-contained, positive pressure breathing equipment, especially suited for confined areas.

SECTION 6: MEASURES TO CONTROL SPILLS OR LEAKS

Emergency measures to be taken if material spill occurs:
Evacuate personnel or isolate hazardous area. Restrict access by unnecessary personnel and personnel without required protection. Pick up material and put in clean and dry containers, labeled for subsequent recovery or final disposal.

Personal protection equipment to deal with the emergency:
Use appropriate protective clothing, as per Section 8, safety goggles and mask with filter for dust particles.

Precautions to be taken to prevent environmental damages:
Prevent runoff to sewers and other watercourses. Do not raise dust when picking up the spill.

Cleaning methods:
Pick up spill immediately. Sweep without raising dust and dispose of in duly labeled containers.

SECTION 7: HANDLING AND STORAGE

Technical recommendations:
Cuprous Oxide is a preventive action, contact fungicide to control the main fungi affecting crops. Read Directions for Use Label completely before using product. Avoid application at high-temperature times.

Precautions:
DO NOT eat or drink while handling product; change clothes at the end of the workday, wash with abundant water and soap.

Specific recommendations regarding safe handling:
Do not expose product to high temperatures and moisture. DO NOT apply product against the wind.

Storage conditions:
Store in a safe, cool and dry place, in its sealed original container, and removed from heat and damage sources, with good ventilation at all times. Label containers correctly and keep them tightly closed.

Packaging recommended and packaging considered as inappropriate by vendor:
Recommended packaging should maintain product isolated from environment and moisture. Avoid metallic packing. Metallic packaging may be dangerous when empty, since they will contain dust residues (powder, solid); comply with all warnings and precaution indications on product label.

SECTION 8: EXPOSURE CONTROL / SPECIAL PROTECTION

Measures to reduce exposure possibilities:
Avoid accumulation of dust in the air.

Control parameters:

Weighted and Absolute Permissible Limits:
None, as per national standards D.S. No 594. 0.8 mg/m^3, OSHA PEL 1 mg/ m^3 (expressed as copper powder).

Breathing protection:
If dust problems exist, use full-face approved and certified respiratory device.

Protection gloves:
Use waterproof protective gloves.

Eye protection:
Use protection goggles to protect from dust or full-face mask, as needed.

Other protection equipment:
Use waterproof protective clothing, adequate as per the emergency.

Ventilation:
Natural or force ventilation systems should be available at all times.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State	: Solid
Appearance and colour	: Fine, reddish coloured powder
Concentration	: 98% of technical active ingredient (84% copper)
pH	: 7.5 – 9.5, 10% water suspension, 20º C
Decomposition temperature	: 1,800 º C
Flash point	: Not applicable
Flammability limits	: Not applicable
Self-ignition temperature	: Not applicable
Fire or explosion hazards	: Product is not combustible
Vapor pressure at 20ºC	: Information not available
Vapor density	: Information not available
Apparent density	: 1.05 – 1.35 g/cc
Solubility on water and other solvents	: Dispersible in water.

SECTION 10: STABILITY AND REACTIVITY

Stability	: Product is stable if stored and handled as recommended.
Conditions to be avoided	: Dust, air, moisture, excessive heat.
Incompatibilities (materials to be avoided)	: Do not mix with acids or oxidizing agents; product is incompatible with Aluminum Oxide (violent reaction when heated), Lithium nitride, and Peroxiformic acid (potentially explosive reaction).
Hazardous decomposition products	: Information not available.
Hazardous combustion products	: Copper oxides are formed.
Hazardous polymerization	: Not applicable.

SECTION 11: TOXICOLOGICAL INFORMATION

Short-term toxicity	: LD_{50} oral rats = > 470 mg/kg.
Chronic or long-term toxicity	: Product has not been registered by NTP, IARC or regulated as carcinogenic by OSHA.
Local or systemic effects	: Individuals with eye, skin or lung problems may be more susceptible to the effects of this product.
Allergic sensitization	: moderate effect when product is formulated.

SECTION 12: ECOLOGY INFORMATION

Instability	: Product does not react in water or air in the absence of initiators.
Persistence / degradability	: Information not available.
Bioaccumulation	: Information not available.
Effects on the environment	: Copper is adsorbed by soil particles. Long-term exposure of soil and vegetation to product may be harmful.

SECTION 13: CONSIDERATIONS REGARDING FINAL DISPOSAL

Methods recommended for the final disposal of this substance, residues and wastes:
Dispose of substance, residues and wastes in places authorised by the authorities for the disposal of substances; typically, the application of limestone is required.

Methods recommended for the final disposal of contaminated containers / packaging:
Dispose of containers as per applicable legislation in effect. It is recommended to wash containers three times and control the acidity and copper contents of the water collected from washing, if waters are to be neutralized and filtered.

SECTION 14: TRANSPORT INFORMATION

Land truck or rail transportation	: Class 9, Packing Group III, GRENA 171
Ocean freight	: Class 9, Packing Group III
Airfreight	: Information Class 9, Packing Group III, IATA/ICAO
River / lake transportation	: Information not available

Applicable markings NCh 2190, safety-marking 21
UN number: 3077

SECTION 15: APPLICABLE STANDARDS

Applicable international standards	: Food and Agricultural Organisation Regulations.
Applicable domestic standards	: NCh 2190 of 1993, transportation of hazardous substances; Markings for risk identification, NCh 382 of 1989, Hazardous substances – General terminology and classification DS 298 and 198, Transportation of hazardous substances, DS No 594 Rules and regulations on the basic sanitary and environmental conditions at the work place. NCh 2245 of 2003, Chemical substances, Material Safety Data Sheets – Requirements, Resolution 2196 SAG, 2000.
Marking on label	: Caution.

SECTION 16: OTHER INFORMATION

All information, recommendations and suggestions herein related to our product are based on reliable testing and data; however, it is the responsibility of the user to determine that the product described herein is compatible with his/her needs from the point of view of toxicity and safety. Given the fact that the effect of the product on the part of third parties is out of our control, we do not provide express or implicit warranty with regard to product use effects; also, we do not assume any responsibility regarding the use given by third parties to the product described herein.