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MATERIAL SAFETY DATA SHEET

PRODUCT NAME : COPPER CYANIDE

1. PRODUCT IDENTIFICATION

Synonyms : Copper (I) Cyanide; Cupricin

CAS No : 544-92-3

Molecular Weight : 89.56

Chemical formula : CuCN

2. COMPOSITION / INFORMATION ON INGREDIENTS

| <i>Ingredient</i> | <i>CAS No</i> | <i>Percent</i> | <i>Hazardous</i> |
|------------------------|-------------------|------------------|------------------|
| CopperCyanide | 544-92-3 | 90-100% | Yes |

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Poison! Danger! May be fatal if swallowed, inhaled or absorbed through skin.contact with acids liberates poisonous gas. Causes severe eye irritation and possible burns. Causes irritation to skin and respiratory tract. Affects blood, cardiovascular system, central nervous system and thyroid.

POTENTIAL HEALTH EFFECTS

In most cases, cyanide poisoning causes a deceptively healthy pink to red skin colour. However, if a physical injury or lack of oxygen is involved, the skin colour may be bluish. Reddening of the eyes and pupil dilatin are sysmptoms of cyanide poisoning. Cyanosis (blue discoloration of the skin) tends to be associated with severe cyanide poisonings. Note : In general metal cyanides usually act less rapidly than the highly toxic alkali cyanides because they tend to release cyanide much more slowly.

INHALATION

This substance inhibit cellular respiration and may cause blood, central Nervous system, and thyroid changes. May cause headache, weakness, dizziness, Laboured breathing nausea, and vomiting, which can be followed by weak and irregular heartbeat, unconsciousness, convulsions, coma and death.May also cause irritation to respiratory tract.

INGESTION

Toxic! May cause nausea, diarrhoea and abdominal pain. Larger doses may produce sudden loss of consciousness and prompt death from respiratory arrest. Smaller but still lethal doses may prolong the illness for one or more hours. Bitter almond odour may be noted on the breath or vomitus. Other symptoms may be similar to those noted for inhalation exposure

SKIN CONTACT

Causes irritation. Discoloration (bright pink colour), dermatitis, rash, severe irritation or burns may occur. Can be absorbed through the skin, particularly through open wounds or abrasions, with symptoms to parallel ingestion.

EYE CONTACT

Severe irritation and possible burns. Dilated pupils are common in severe poisoning. Corneal edema may occur. Blindness and damage to the optic nerves and retina may result

CHRONIC EXPOSURE

Prolonged or repeated exposure may cause a 'cyanide' rash and nasal sores, headache, weakness, nausea, dizziness, loss of appetite, insomnia, memory loss, tremors, functional changes in hearing, enlarged thyroid gland, folate abnormalities, palpitations, chest discomfort upper respiratory tract irritation, nose bleeds and eye irritation.

AGGRAVATION OF PRE-EXISTING CONDITIONS

Workers using cyanides should have a preplacement and periodic medical exam. Those with history of central nervous system, thyroid, skin, heart or lung diseases may be more susceptible to the effects of this substance.

4. FIRST AID MEASURES

IN CASE OF CYANIDE POISONING, start first aid treatment immediately, then get medical attention. A cyanide antidote kit (amyl nitrite, sodium nitrite beginning work with cyanides. Oxygen and amyl nitrite can be given by a first responder before medical help arrives. Allow Victim to inhale amyl nitrite for 15-30 seconds per minute until sodium nitrite and sodium thiosulfate can be administered intravenously (see Note to Physician). A new amyl nitrate ampule should be used every 3 minutes. If conscious but symptoms (nausea, difficult breathing dizziness, etc.) are evident, give oxygen. If consciousness is impaired (non responsiveness, slurred speech, confusion, drowsiness) or the patient is unconscious but breathing, give oxygen and amyl nitrite by means of a respirator. If not breathing, give oxygen and amyl nitrate immediately by means of a positive pressure respirator (artificial respiration)

INHALATION

If inhaled, remove to fresh air. Administer antidote kit and oxygen per preplanned instructions if symptoms occur. Keep patient warm and at rest. Do not give mouth-to-mouth resuscitation.

INGESTION

If ingested, antidote kit and oxygen should be administered per above. If the patient is conscious immediately give the patient activated charcoal slurry. Never give anything by mouth to an unconscious person. Do not induce vomiting as it could interfere with skin contact

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothings and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse. Administer antidote kit and oxygen per preplanned instructions if symptoms occur.

EYE CONTACT

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

NOTE TO PHYSICIAN

If patient does not respond to amyl nitrite, inject intravenously with 10ml of a 3% solution of sodium nitrite at a rate of not more than 2.5 to 5 ml per minute. Once nitrite administration is complete, follow directly with 50 ml of a 25% solution of sodium thiosulfate at the same rate by the same route. Give victim oxygen and keep under observation. If exposure was severe, watch victim for 24-48 hours. If signs of cyanide poisoning persist or re-appear, repeat nitrite and thio sulfate injections 1 hour later in 1/2 the original doses. Cyanocobalamin (B12), 1mg intramuscularly, may speed recovery. Moderate cyanide exposures need be treated only by supportive measures such as bed rest and oxygen.

5. FIRE FIGHTING MEASURES

FIRE

Not combustible, but upon decomposition or contact with acids, this material releases highly flammably and toxic hydrogen cyanide gas.

FIRE EXTINGUISHING MEDIA

Use any means suitable for extinguishing surrounding fire. Do not use carbondioxide. carbondioxide can react with this material in the presence of moisture to produce hydrogen cyanide Water spray may be used to keep fire-exposed containers cool. React slowly with with water to form hydrogen cyanide. Do not allow water runoff to enter sewers or waterways.

SPECIAL INFORMATIONS

In the event of a fire, wear full protective clothing and NISOH - resuscitator use. Approved self contained breating apparatus with full face pieces operated in the pressure demand or other positive pressure demand.

6. ACCIDENTAL RELEASE MEASURES

Spills: Ventilate area of leak or spill. Allow only qualified personnel to handle spill. Clean-up personnel require protective clothing and respiratory protection from vapours. Collect material and place in a close container for recovery or disposal. Do no flush to sewer ! Decontaminate liquid or solid residues in spill area with sodium or calcium hypochlorite solution. US regulation (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the us Coast Guard National Response Centre is (800) 44-8802.

7. HANDLIING AND STORAGE

keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from incompatibles. Workers must carefully follow good hygenic practices including no eating, drinking or smoking in workplace. Proper use and maintenance of protective equipment is essential. Workers using cyanide need preplacement and annual medical exams. Special training should be given to workers using cyanide. Containers of this

material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product. Do not store near combustibles or flammables because subsequent fire fighting with water could lead to cyanide solution run off. Do not store under sprinkler systems. All persons with the potential for cyanide poisoning should be trained to provide immediate First Aid using oxygen and amyl nitrite. A cyanide antidote kit (amyl nitrite, sodium nitrite and sodium thiosulfate) should be readily available in cyanide workplaces. The antidotes should be checked annually to ensure they are still within their shelf-lives. Identification of community hospital and emergency medical squads in order to equip and train them on handling cyanide emergencies is essential.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Airborne Exposure Limits

OSHA Permissible Exposure Limit (PEL)

5 mg /m³ skin (TWA) (as CN)

ACGIH Threshold Limit Value (TLV)

5 mg/m³ (STEL) Ceiling, skin, as CN

VENTILATION SYSTEM

A system of Local and / or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exchange ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation. A manual of recommended practices, most recent edition, for details.

PERSONAL RESPIRATORS (NIOSH Approved)

If the exposure limit is exceeded, wear a supplied air, full-face piece respirator, air lined hood, or full-face piece self-contained breathing apparatus. This substance has poor warning properties.

SKIN PROTECTION

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact

EYE PROTECTION

Use chemical safety goggles and/or full-face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

White to cream-colored powder, colourless or dark green orthorhombic crystals or dark red monoclinic crystals.

Odour : Slight, bitter-almond odour of hydrogen cyanide; odourless if completely dry.

Solubility : Practically insoluble in water

Specific Gravity : 2.92

pH : Aqueous solutions are strongly alkaline.

% Volatiles by volume @ 2C (70F) : 0

Boiling Point : Decomposes

Melting Point : 474C (885F)

Vapour Density (Air = 1) : Not applicable

Vapour Pressure (mm Hg) : Not applicable

Evaporation Rate (BuAc = 1) : No information found

10. STABILITY AND REACTIVITY

Stability: Very stable when dry. Moisture will cause slow decomposition, releasing poisonous hydrogen cyanide gas.

Hazardous Decomposition Products : Emits toxic fumes of cyanide and oxides of nitrogen when heated to decomposition.

Hazardous Polymerisation : Will not occur.

Incompatibilities : Reacts with acids to liberate toxic and flammable hydrogen cyanide gas. Water or weak alkaline solutions can produce dangerous amounts of hydrogen cyanide in confined areas. Reacts with carbon dioxide in air to form hydrogen cyanide gas. Incompatible with strong oxidizing agents, magnesium, acetylene gas, 3-methoxy-2-nitrobenzoyl chloride, nitrate salts and metal chlorates per chlorates and nitrates.

11. TOXICOLOGICAL INFORMATION

Copper cyanide : 1265 mg/kg LD 50 oral red

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| Ingredient |NTP Carcinogen | | |
|---------------------------|---------------------|-------------|---------------|
| | known | Anticipated | LARC Category |
| Copper Cyanide (544-92-3) | | No | No None |

12. DISPOSAL CONSIDERATIONS

Cyanides must be oxidized to harmless waste, before disposal. An alkaline solution (pH about 10) is treated with chlorine or commercial bleach in excess to decompose cyanide. When cyanide-free, it can be neutralised whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirement.

13. TRANSPORT INFORMATION

Domestic (Land, D.O.T.)

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Proper Shipping Name : **COPPER CYANIDE**
Hazard Class : **6.1**
UN/NA : **UNI587**
Packing Group : **II**

International (Water, I.M.O.)

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Proper Shipping Name : **COPPER CYANIDE**
Hazard Class : **6.1**
UN/NA : **UNI587**
Packing Group : **II**
Information report for product/size : **500g**

International (Air, I.C.A.O)

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*Proper Shipping Name : **COPPER CYANIDE***

*Hazard Class : **6.1***

*UN/NA : **UNI587***

Packing Group : II

*Information reported for product / size : **500g***