

CYANCO® SODIUM CYANIDE, BRICKS 98% ± 1%

Doc. No. COR-UNI-EHSS-SDS-002
Version 3.0 US

Revision Date: 1/25/2016
Print Date: 2/1/2016

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements of other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Tradename/Synonym : CYANCO® SODIUM CYANIDE, BRICKS 98% ± 1%
 Product Use : For Industrial Use
 Function : Electroplating Agent
 Gold Mining
 Company : Cyanco
 1920 Country Place Parkway
 Suite 400
 Pearland, Texas 77584
 USA

Medical Emergency

US: Poison Control Center : 800.222.1222

Transport Emergency

US: CHEMTREC : 800.424.9300 Customer Number: CCN6043

Canada: CANUTEC : 613.996.6666

Product Information : 832.590.3644

Telefax : 713.436.5202

Contact Person : SDS Coordinator, 832.590.3644

SECTION 2. HAZARDS IDENTIFICATION

DANGER!



- Very toxic by inhalation, in contact with skin and if swallowed.
- Contact with acids liberates very toxic gas.
- Irritating to eyes and skin.
- Very toxic to aquatic organisms.
- May cause long-term adverse effects in the aquatic environment.
- Causes severe eye burns.
- Under the action of acids (as well as carbon dioxide) hydrocyanic acid is released which is combustible and may react with air to form explosive gas mixtures.
- Hydrocyanic acid may cause all degrees of poisoning.

Precautions

Eye Contact : Corrosive. May cause burns resulting in permanent damage.
 Skin Contact : Very toxic. May be fatal if absorbed through the skin.
 Inhalation : Very toxic. May be fatal if inhaled.
 Ingestion : Very toxic. May be fatal if swallowed.
 Repeated Exposure : Adverse effects from long-term exposure may include: thyroid dysfunction, central nervous system effects.
 Target Organs : Central Nervous System, Respiratory System, Thyroid
 Carcinogenicity : None of the components in this material ≥ 0.1% are listed by OSHA, NTP or IARC as a carcinogen.
 Potential Environmental Effect : Very toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

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SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

Information on Ingredients / Hazardous Components

| | | | | |
|----------------|---------|-----------|---------------------|----------|
| Sodium Cyanide | CAS No. | 143-33-9 | Percent (Wt. / Wt.) | 97 – 99% |
| | EC No. | 205-599-4 | | |

Other Information : This material is classified as hazardous under OSHA regulations.

SECTION 4. FIRST AID MEASURES

General Advice

WARNING! If exposed to sodium cyanide, seek qualified medical attention immediately!
Rescuers or medical responders should first of all protect themselves from exposure!
Decontaminate the victim to prevent further absorption and exposure to rescuers and monitor vital signs.

- Skin Contact**
 - No cases of cyanide intoxication have been observed to date following contact with dry sodium cyanide on dry skin free of injuries. However, if the dry sodium cyanide comes in contact with moisture or acids, then hydrogen cyanide may be released, causing cyanide intoxication. • May cause caustic burns to skin upon contact due to high pH. • Wash off immediately using large amounts of water (and soap if available) while removing all contaminated clothes and shoes. • Immediately contact or summon an emergency physician in case of intoxication symptoms.

- Eye Contact**
 - In case of contact with the eyes, immediately flush eyes with copious amounts of water for a minimum of 15 minutes while removing clothes. • It is important to seek medical attention for all eye exposures due to potential caustic burns to the eyes. • Immediately contact or summon an emergency physician in case of intoxication symptoms. • An ophthalmologist should also be consulted for evaluation of caustic burns to the eyes.
 - Note:** Eye burns may not be apparent for up to 48 hours post exposure due to the caustic properties of sodium cyanide.

- Inhalation**
 - Inhalation is possible if cyanide is in the form of aerosols, mists, dusts, or smoke. • Never perform direct mouth-to-mouth or mouth-to-nose artificial respiration. • Use artificial respiration bag or respirator due to the potential danger of poisoning the rescuers! • Maintain an open airway. • In case of breathing difficulties immediately apply oxygen. • Immediately contact an emergency physician and notify of cyanide / hydrocyanic acid poisoning.

- Ingestion**
 - Thoroughly rinse mouth with water. • Seek professional medical care immediately. • Do not induce vomiting. • Call emergency physician immediately and notify of cyanide / hydro-cyanic acid poisoning. • Immediately transport to a medical facility.

Notes to Physician

IMPORTANT: Specific antidote and treatment may vary by region. If you are not familiar with current treatment recommendations, you should contact the Poison Control Center for your region or country for specific recommendations and guidelines.

Possible Signs of Poisoning Intoxication is classified by 2 categories: • Mild poisoning • Severe poisoning

The following symptoms are not sufficient to ensure a correct diagnosis:

Symptoms of the Central Nervous System **Early Stage:** • headache • dizziness • drowsiness • nausea
Advanced Stage: • seizures • coma

Pulmonary Symptoms **Early Stage:** • dyspnea • tachypnea
Advanced Stage: • hyperventilation • Cheyne-Stokes respiration • apnea

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Cardiovascular Symptoms

Early Stage: • hypertension • sinus arrhythmia • atrioventricular arrhythmia • bradycardia

Advanced Stage: • tachycardia • complex arrhythmia • cardiac arrest

Skin Symptoms

Early Stage: • rosy skin color

Advanced Stage: • cyanosis

Effect on the Metabolism

Lactate acidosis: pH 7.1 and lactate level of 17 mmol/l are described.

Treatment

The treatment advice may vary by region. Contact a regional poison control center for appropriate antidote treatment used in your region.

CAUTION: This is an outline of antidotes available for informational purposes. It is important for the treating physician to be familiar with the administration of cyanide antidotes available in the country where the chemical is being used! Rapid treatment with appropriate antidote therapy is essential to saving lives during a high dose acute exposure to cyanide.

NOTE: Removal of toxic substance has equal importance to implementation of antidote therapy.

Mild Poisoning

- Treatment is dependent on clinical presentation with symptoms and history of exposure (related to dose).
- 100% oxygen (medical grade) and artificial respiration if indicated.
- Closely monitor patient and their vital signs (blood pressure, pulse and respirations).
- Monitor the patient for onset of symptoms or deterioration of status.
- Depending on the pathology and clinical findings, based on strictly monitored controls of the clinical findings, it may be necessary for the physician to implement symptom-oriented treatment for pulmonary edema prophylaxis.
- X-rays of the lungs may be necessary for pulmonary edema diagnosis.

Severe Poisoning

- Specific antidote treatment can be indicated for moderate to severe cyanide intoxication.
- It is important to know that there are several different types of antidotes available for treatment of cyanide intoxication in different countries.

For All Cyanide Exposure

- All cyanide exposed persons should undergo continued monitoring for several hours, even if patient feels well to ensure there are no residual or recurrent poisoning symptoms.
- Artificial respiration with 100% oxygen (medical grade).
- Immediate antidote administration with the legal antidote for the country of the exposure.

Commonly Used Antidotes

Met hemoglobin-Forming Agent

Nitrite Therapy: amyl nitrite, sodium nitrite, sodium thiosulfate.

For Moderate to Severe Exposures (patient still conscious)

Amyl Nitrite Spirols: 1-3 spirols administered as an inhalant, held 1-2 inches under the nose for 15 seconds, and then remove for 15 seconds. Read medication information insert prior to administering.

Sodium nitrite 300-600 mg administered intravenously over a period of 5 to 15 minutes. Sodium thiosulfate (12.5 g - 100-500 mg/kg weight) intravenously over a period of 15-20 minutes. If patient is conscious, then Sodium thiosulfate may be administered as an antidote by itself: (See antidote package information insert).

Sodium thiosulfate (12.5 g - 100-500 mg/kg weight) IV may be administered depending on the clinical presentation and symptoms.

Complexing Antidote Agent

Hydroxocobalamin - commonly known as the Cyanokit®.

Treatment as Follows:

Administer hydroxocobalamin (Cyanokit®) 5 g i.v. (70 mg/kg b.w. in adults) by infusion over a period of 20-30 minutes. Administration of this dose can be repeated as required depending on the severity of poisoning. Infusion time for repeated dose: 30 minutes to 2 hours.

The only permissible route of administration for hydroxocobalamin is intravenously. The physician should read the medication package information carefully to ensure proper reconstitution to liquid state and administration of antidote!

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SECTION 5. FIRE-FIGHTING MEASURES

Flammable Properties

| | |
|---|--|
| Flash Point | Not Combustible |
| Lower Explosion Limit | Not Applicable |
| Upper Explosion Limit | Not Applicable |
| Autoignition Temperature | Not Applicable |
| Suitable Extinguishing Media | Quenching Powder In case of fire in the surroundings: alkali powder quenching agent. |
| Unsuitable Extinguishing Media | Carbon dioxide (CO ₂) <u>must not</u> be used for safety reasons. |
| Exposure Hazards During Fire Fighting | Hydrocyanic acid (hydrogen cyanide) may be released in case of fire. |
| Personal Protective Equipment for Fire Fighters | As in any fire, wear self-contained positive-pressure breathing apparatus, (MSHA/NIOSH approved or equivalent) and full protective gear. |

Further Information

- Standard procedure for chemical fires. Ensure there are sufficient retaining facilities for water used to extinguish fire.
- Water used to extinguish fire should not enter drainage systems, soil or stretches of water.
- Contaminated fire-extinguishing water must be disposed of in accordance with the regulations issued by the appropriate local authorities.
- Fire residues should be disposed of in accordance with local, state and federal regulations.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personnel Precautions

- Wear personal protective equipment.
- Keep out unprotected persons.
- Keep unauthorized persons away.
- Ensure sufficient ventilation.
- Avoid skin contact because of the danger of skin absorption.
- Make safe or remove all sources of ignition.

Environmental Precautions

- Do not allow entrance in soil, stretches of water, groundwater, drainage systems or surface water.
- Cyanide-containing sewage water and solutions must be decontaminated before entering a public canal, network or stretch of water.
- Do not use a neutralizing agent if runoff can enter nearby streams, rivers or other surface waterways.
- On contact with acid, hydrogen cyanide is produced.

Methods for Cleanup in the Event of a Spill

- Pick up mechanically if in solid form.
- Absorb with liquid-binding material e.g., inert absorbent if in solution.
- Collect in suitable containers.
- Dispose of material in accordance with local, state and federal regulations.
- Waste to be packed like clean product and to be properly labeled.
- Identification label on packages not to be removed until recycled.

SECTION 7. HANDLING & STORAGE

NOTE: Always have on hand a cyanide antidote kit and trained medical responders who can administer first aid before beginning work with this product.

Handling

Safe Handling Advice

- Container may be opened only under exhaust ventilation hood.
- Seal container hermetically immediately after use.
- Store under lock and key or in a way that qualified persons have access to it.
- Use caution when opening the package, since toxic and caustic gases and vapors may escape.

Advice on Protection Against Fire and Explosion

- The product is not combustible.
- See Section 5.

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Storage

Requirements for Storage Areas and Containers

- Keep container tightly sealed and store in a dry, well-ventilated place.
- Ensure there are sufficient retaining facilities for water used to extinguish fire.

Unsuitable Materials

- Aluminum • Brass • Copper

Advice on Common Storage

- Do not store together with acid and acidic salts.
- Keep away from food, drink and animal feedstuffs.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Product Occupational Exposure Guidelines

| Sodium Cyanide | CAS-No. 143-33-9 | EC No. 205-599-4 |
|----------------|--|------------------|
| PEL (OSHA) | 5mg/m ³ as CN 8-hr Time-Weighted Avg | Skin Designation |
| TLV (ACGIH) | 5 mg/m ³ as CN Ceiling Limit | Skin Designation |

Component Occupational Exposure Guidelines

| Hydrogen Cyanide | CAS-No. 74-90-8 | EC No. 200-821-6 |
|------------------|---|------------------|
| PEL (OSHA) | 10 ppm as CN 8-hr Time-Weighted Avg | Skin Designation |
| | 11mg/m ³ as CN 8-hr Time-Weighted Avg | Skin Designation |
| TLV (ACGIH) | 4.7 ppm as CN Ceiling Limit | Skin Designation |
| | 5 mg/m ³ as CN Ceiling Limit | Skin Designation |

Engineering controls

- Engineer out the risk of exposure if feasible.
- Ensure suitable ventilation at the work place and with operational machinery.

Personal Protective Equipment

Respiratory Protection

- A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or applicable state/federal requirements must be followed whenever workplace conditions warrant respirator use.
- NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of respirators.

Hand Protection

- Natural Rubber • Nitrile • Polychloroprene w/ natural latex rubber • PVC

Note: The above mentioned hand protection is based on knowledge of the chemistry and anticipated uses of this product but it may not be appropriate for all workplaces. A hazard assessment should be conducted prior to use to ensure suitability of gloves for specific work environments and processes prior to use.

Eye Protection

- Impact resistant chemical protective goggles
- Face-shield with brow guard

Skin and Body Protection

- Wear chemical protective suit.
- During cleaning work wear rubber or plastic boots.
- To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment in accordance with the OSHA PPE Standard (29CFR1910.132) be conducted before using this product.
- A safety shower and eye wash fountain must be readily available.
- Wash contaminated clothing before re-use.

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Hygiene Measures

- Avoid contact with skin.
- After contact with skin, wash immediately with plenty of water.
- No eating, drinking, smoking, chewing gum or snuffing tobacco at work.
- Wash face and/or hands before break and end of work.

Protective Measures

- All precautionary measures indicated have to be observed.
- The workplace related airborne concentrations have to be kept below the indicated exposure limits.
- If the limits at the workplace are exceeded and/or larger amounts are released (leakage, spilling, dust) the indicated respiratory protection should be used. (see above)

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical

Form : Solid
 Color : White
 Odor : Odorless

Note: Can have bitter almond-like odor if hydrogen cyanide is present. Some people are unable to smell cyanide. Others can smell it at first, but then can be desensitized to the odor.

Chemical

pH : Approx 12.0
 Aqueous Solution
 Melting point/range : 562 °C
 Boiling point/range : 1497 °C
 Flash Point : Not Combustible
 Flammability : Not Flammable
 Autoignition Temperature : Not Applicable
 Lower Explosion Limit : Not Applicable
 Upper Explosion Limit : Not Applicable
 Vapor Pressure : 100 Pa at 800 °C
 Density : Approx 1.6 g/cm³ at 20 °C
 Bulk Density : Aporox. 750 – 950 kg/m³
 Powder, Granulate, Pellets
 Water Solubility : Approx. 379 g/l at 20 °C
 Approx. 450 g/l at > 35 °C
 Partition Coefficient (N-octanol/water) : log Pow: -0.44
 (calculated)

Further Information

Miscibility in Water : Completely Miscible

SECTION 10. STABILITY AND REACTIVITY

Materials to Avoid

- Under the action of acids (as well as carbon dioxide) hydrocyanic acid is released which is combustible and may react with air to form explosive gas mixtures.
- Keep away from acidic salts.

Hazardous Decomposition Products

- HCN: Hydrogen cyanide (hydrocyanic acid) forms if heated above 300 °C.

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SECTION 11. TOXICOLOGICAL INFORMATION

Sodium Cyanide

- Acute Oral Toxicity : LD50 Rat: 5 mg/kg
Method: Literature
- Acute Dermal Toxicity : LD50 Rabbit(female): 11.8 mg/kg
Method: Literature
- Skin Irritation : Due to acute dermal toxicity, the irritative effect on the skin cannot be determined.
- Eye Irritation : Rabbit
Irritating
- Repeated Dose Toxicity : Oral Rat
Testing Period: 11½ months
NOAEL: 75 mg/kg
Target Organ/effect: thyroid, brain
Feeding experiments
Chronic
Oral Rat
Testing Period: 90 days
NOAEL: approx. 0.3 mg/kg
Target Organ/effect: reproductive system
Drinking Water Analysis
Subchronic toxicity
Oral Mouse
NOAEL: approx. 16.2 mg/kg
Drinking Water Analysis
Subchronic toxicity
- Human Toxicity :
 - Inhalation is possible if cyanide is in the form of aerosols, mists, dusts, or smoke.
 - Very toxic by inhalation and if swallowed.
 - Inhaling of HCN (at already approx. 200 ppm HCN in the air breathed) or swallowing (approx. 200 - 300 mg NaCN) can result in immediate unconsciousness and death.
 - Can be absorbed through the skin.
 - Poisoning has an effect on the central nervous system.
 - Irritating to eyes, respiratory system and skin.
 - Following long-term exposure individual cases of thyroid dysfunction have been described with electroplaters and silver polishers.

SECTION 12. ECOLOGICAL INFORMATION

Elimination Information (Persistence and Degradability)

- Biodegradability : Potentially biodegradable
Abiotic degradation
Hydrolysis
- Bioaccumulation : Low
- Mobility : In Air: High as HCN

Ecotoxicity Effects

- Fish : LC50 Leuciscus idus melanotus: 0.07 mg/l
- Daphnia : EC50 Daphnia magna: 0.3 mg/l
- Bacteria : EC50 Escherichia coli: 0.004 mg/l

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SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal

- Waste must be disposed of in accordance with local, state, provincial and federal laws and regulations.
- Empty containers must be handled with care due to product residue.

SECTION 14. TRANSPORT INFORMATION

DOT / AAR / Sea Transport IMDG-Code

Class : 6.1
 UN Number : 1689
 Packing Group : 1
 Proper Shipping Name : SODIUM CYANIDE, SOLID

GHS Shipping Labels

DANGER!



Marine Pollutant : Yes

Air Transport ICAO-TI/IATA-DGR

Class : 6.1
 UN Number : 1689
 Packing Group : 1
 Proper Shipping Name : SODIUM CYANIDE, SOLID

GHS Shipping Labels

DANGER!



Loading Instructions/Remarks

IATA_C : ERG-Code 6L
 IATA_P : ERG-Code 6L
 IMDG : Do not stow in external container rows

Transport/Further Information

Do not store together with acids (danger of toxic gases) or with foodstuffs, consumables and feedstuffs.

NOTE: Sodium cyanide is NOT a DOT TIH or PIH.

SECTION 15. REGULATORY INFORMATION

US Federal Regulations

OSHA

If listed below, chemical specific standards apply to the product or components:

- None Listed

CAA Section 112

If listed below, components present at or above the de minimus level are hazardous air pollutants:

- Sodium Cyanide CAS No. 143-33-9

CERCLA Reportable Quantities

If listed below, a reportable quantity (RQ) applies to the product based on the percent of the named component:

- Sodium Cyanide CAS No. 143-33-9 Reportable Quantity: 10 lbs

SARA Title III Section 311/312 Hazard Categories

The product meets the criteria only for the listed hazard classes:

- Acute Health Hazard

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SARA Title III Section 313 Reportable Substances

If listed below, components are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

- Sodium Cyanide CAS No. 143-33-9 Reportable Quantity: 10 lbs

Toxic Substance Control Act (TSCA)

If listed below, non-proprietary substances are subject to export notification under Section 12 (b) of TSCA:

- None Listed

State Regulations

California Prop 65

A warning under the California Drinking Water Act is required only if listed below:

- None Listed

Canadian Regulations

This SDS has been prepared in compliance with the Controlled Product Regulations except for use of the 16 headings.

WHMIS Classification

- D1 A • E

International Chemical Inventory Status

Unless otherwise noted, this product is in compliance with the inventory listing of the countries listed below.

Listed/registered:

- Europe (EINECS/ELINCS) • USA (TSCA) • Canada (DSL) • Australia (AICS)
- Japan (MITI) • Korea (TCCL) • Philippines (PICCS) • China

European Union Risk and Safety Phrases

Risk Sodium cyanide is classified as toxic.

- R25 • R26 • R27 • R28 - Very toxic by inhalation, in contact with skin and if swallowed.
- R32 – Contact with acids liberates very toxic gas.
- R36 • R37 • R38 - Irritating to eyes, respiratory system and skin.
- R41 – Risk of serious damage to the eyes.
- R50 • R53 - Very toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment.
- R55 • R56 • R57 - Toxic to fauna, soil organisms and bees.
- R67 - Vapors may cause drowsiness and dizziness.

Safety Sodium cyanide is a hazardous substance.

- S1 • S2 • S4 - Keep locked up, out of the reach of children and away from living quarters.
- S7 • S9 - Keep container tightly closed and in a well ventilated place.
- S13 • S14 - Keep away from food, drink and animal feeding stuffs, acids, acid salts and carbon dioxide fire extinguishers.
- S18 - Handle and open container with care.
- S20 • S21 - When using do not eat, drink or smoke.
- S22 - Do not breathe dust.
- S24 • S25 - Avoid contact with skin and eyes.
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S27 - Take off immediately all contaminated clothing.
- S28 - After contact with skin, wash immediately with plenty of water.
- S29 - Do not empty into drains.
- S36 • S37 • S39 - Wear suitable protective clothing, gloves and eye/face protection.
- S38 - In case of insufficient ventilation, wear suitable respiratory equipment.
- S40 - To clean the floor and all objects contaminated by this material use sodium or calcium hypochlorite solution.
- S41 • S43 - In case of fire and/or explosion do not breathe fumes, use water, chemical powder or foam. Never use carbon dioxide.
- S45 - In case of accident or if you feel unwell seek medical attention immediately (show the label where possible).
- S46 • S64 - If swallowed, rinse mouth with water (only if the person is conscious), seek medical advice immediately and show this label.
- S50 - Do not mix with carbon dioxide, acids or acid salts
- S51 - Use only in well-ventilated areas.
- S53 - Avoid exposure – Obtain special instruction before use.

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- S56 - Dispose of this material and its container to hazardous or special waste collection point
- S59 - Refer to manufacturer for information on recovery/recycling.
- S57 - Use appropriate containment to avoid environmental contamination.
- S61 - Avoid releases to the environment. Refer to special instructions/Safety data sheet.
- S63 - In case of accident by inhalation: remove casualty to fresh air and keep at rest.

SECTION 16. OTHER INFORMATION**HMIS Ratings**Health: 3Flammability: 0Physical Hazard: 1**Further Information**

This version replaces all previous versions.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Significant changes since the last version are highlighted in the margin with a double bar.