









# Material Safety Data Sheet

| HAZARD WARNINGS  | RISK PHRASES  | PROTECTIVE CLOTHING   |
|--|---|---|
|   <br> | <p>Flammable material; avoid heat and sources of ignition.<br/>           Highly toxic compound, do not ingest or inhale. Avoid all contact with this material.<br/>           Irritating to skin, eyes, and the respiratory system.<br/>           Environmental hazard.<br/>           This material is very toxic to aquatic organisms and may cause long term adverse effects to the aquatic environment.<br/>           May ignite or generate flammable gas in the presence of moisture.<br/>           Hygroscopic -- keep container tightly sealed.<br/>           Stench -- do not inhale, use under a fume hood.<br/>           Store under nitrogen.<br/>           Refrigerate and vent pressure slowly before opening.</p> |     |

## Section I. Chemical Product and Company Identification

|                  |  |                                 |   |
|------------------|--|---------------------------------|---|
| Chemical Name    | <b>Sodium Cyanoborohydride,</b><br>(=Sodium Cyanotrihydridoborate), [Reducing Agent] |                                 |   |
| Catalog Number   | S0396  | Supplier                        | TCI America<br>9211 N. Harborage St.<br>Portland OR<br>1-800-423-8616                     |
| Synonym          | Sodium Cyanotrihydridoborate   |                                 |   |
| Chemical Formula | NaBH <sub>3</sub> CN   |                                 |   |
| CAS Number       | 25895-60-7   | In case of<br>Emergency<br>Call | <b>Chemtrec®</b><br><b>(800) 424-9300 (U.S.)</b><br><b>(703) 527-3887 (International)</b> |

## Section II. Composition and Information on Ingredients

| Chemical Name   | CAS Number | Percent (%)         | TLV/PEL        | Toxicology Data |
|---|------------|---------------------|----------------|-----------------|
| Sodium Cyanoborohydride,<br>(=Sodium Cyanotrihydridoborate), [Reducing Agent] | 25895-60-7 | Min. 95.0<br>(Tit.) | Not available. | Not available.  |

## Section III. Hazards Identification

|                        |   |
|------------------------|---|
| Acute Health Effects   | <p>Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.</p> <p>Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death.</p> <p>This material produces an irritating stench. Do not inhale and always use under a fume hood. Inhalation can result in inflammation of the respiratory system, headaches, nausea, and vomiting. Always cover all exposed skin with an impermeable layer and use proper eye protection. A OSHA/MSHA approved dust and vapor respirator is required when working with this material.</p> <p>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p> |
| Chronic Health Effects | <p><b>CARCINOGENIC EFFECTS</b> : Not available.<br/> <b>MUTAGENIC EFFECTS</b> : Not available.<br/> <b>TERATOGENIC EFFECTS</b> : Not available.<br/> <b>DEVELOPMENTAL TOXICITY</b>: Not available.</p> <p>Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>   |

## Section IV. First Aid Measures

|              |   |
|--------------|---|
| Eye Contact  | Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.  |
| Skin Contact | In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.   |
| Inhalation   | If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.   |
| Ingestion    | INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. |

**Section V. Fire and Explosion Data**

|                                      |  |                  |                 |
|--------------------------------------|--|------------------|-----------------|
| Flammability                         | Flammable.   | Auto-Ignition    | 175 °C (347 °F) |
| Flash Points                         | Not available.   | Flammable Limits | Not available.  |
| Combustion Products                  | These products are toxic carbon oxides (CO, CO <sub>2</sub> ), nitrogen oxides (NO <sub>x</sub> ), metallic oxides, borates.<br>WARNING: Very toxic cyanide gas may be produced in a fire. Do not inhale.  |                  |                 |
| Fire Hazards                         | Not available.   |                  |                 |
| Explosion Hazards                    | Risks of explosion of the product in presence of mechanical impact: Not available.<br>Risks of explosion of the product in presence of static discharge: Not available.  |                  |                 |
| Fire Fighting Media and Instructions | Flammable solid.<br>SMALL FIRE: Use DRY chemical powder.<br>LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Consult with local fire authorities before attempting large scale fire-fighting operations. |                  |                 |


**Section VI. Accidental Release Measures**

|                            |   |
|----------------------------|---|
| Spill Cleanup Instructions | Flammable material. Highly toxic material. Irritating material. Environmentally hazardous material. May ignite or generate flammable gas in the presence of moisture. Hygroscopic material. Stench material.<br>Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal. |
|----------------------------|---|

**Section VII. Handling and Storage**

|                                  |   |
|----------------------------------|---|
| Handling and Storage Information | FLAMMABLE SOLID. HIGHLY TOXIC. IRRITANT. ENVIRONMENTAL HAZARD. MAY IGNITE OR GENERATE FLAMMABLE GAS IN THE PRESENCE OF MOISTURE. HYGROSCOPIC. STENCH. STORE UNDER NITROGEN. REFRIGERATE AND VENT PRESSURE SLOWLY BEFORE OPENING. Keep locked up. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. DO NOT ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively.<br>Always store away from incompatible compounds such as oxidizing agents, acids, moisture. |
|----------------------------------|---|

**Section VIII. Exposure Controls/Personal Protection**

|                      |  |
|----------------------|--|
| Engineering Controls | Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.  |
| Personal Protection  | Splash goggles. Lab coat. Dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.<br> |
| Exposure Limits      | Not available.   |

**Section IX. Physical and Chemical Properties**

|                       |  |                       |   |
|-----------------------|--|-----------------------|---|
| Physical state @ 20°C | Solid. (White Powder.)                 | Solubility            | Very soluble in methanol.<br>Slightly soluble in ethanol, isopropylamine.<br>Insoluble in ethyl ether, benzene, hexane. |
| Specific Gravity      | 1.199 (water=1)                        |                       | Solubility (g/100g solvent): in water at 29 °C, 212; in Tetrahydrofuran at 28 °C, 37.2; in Diglyme at 25 °C, 17.6.      |
| Molecular Weight      | 62.84                                  | Partition Coefficient | Not available.  |
| Boiling Point         | Not available.                         | Vapor Pressure        | Not applicable.   |
| Melting Point         | 240 to 242 °C (464 to 467.6 °F) (Dec.) | Vapor Density         | Not available.  |
| Refractive Index      | Not available.                         | Volatility            | Not available.  |
| Critical Temperature  | Not available.                         | Odor                  | Stench.   |
| Viscosity             | Not available.                         | Taste                 | Not available.  |

**Section X. Stability and Reactivity Data**

|                           |   |
|---------------------------|---|
| Stability                 | This material is stable if stored under proper conditions. (See Section VII for instructions) |
| Conditions of Instability | Avoid excessive heat and light.   |
| Incompatibilities         | Reactive with strong oxidizing agents, acids, moisture.                                       |

**Section XI. Toxicological Information**

|                       |  |
|-----------------------|--|
| RTECS Number          | Not available.   |
| Routes of Exposure    | Eye Contact. Ingestion. Inhalation.  |
| Toxicity Data         | Not available.   |
| Chronic Toxic Effects | <b>CARCINOGENIC EFFECTS</b> : Not available.<br><b>MUTAGENIC EFFECTS</b> : Not available.<br><b>TERATOGENIC EFFECTS</b> : Not available.<br><b>DEVELOPMENTAL TOXICITY</b> : Not available.<br>Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.  |
| Acute Toxic Effects   | Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.<br>Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death.<br>This material produces an irritating stench. Do not inhale and always use under a fume hood. Inhalation can result in inflammation of the respiratory system, headaches, nausea, and vomiting. Always cover all exposed skin with an impermeable layer and use proper eye protection. A OSHA/MSHA approved dust and vapor respirator is required when working with this material.<br>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound. |



**Section XII. Ecological Information**

|                    |                |
|--------------------|----------------|
| Ecotoxicity        | Not available. |
| Environmental Fate | Not available. |

**Section XIII. Disposal Considerations**

|                |   |
|----------------|---|
| Waste Disposal | Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance. |
|----------------|---|

**Section XIV. Transport Information**

|                      |   |
|----------------------|---|
| DOT Classification   | DOT Class 4.1: Flammable solid.<br>DOT Class 6.1: Toxic material.   |
| PIN Number           | UN 3179   |
| Proper Shipping Name | Flammable solid, toxic, inorganic, n.o.s.   |
| Packing Group (PG)   | II  |
| DOT Pictograms       |   |

**Section XV. Other Regulatory Information and Pictograms**

|                               |  |
|-------------------------------|--|
| TSCA Chemical Inventory (EPA) | This compound is <b>ON</b> the EPA Toxic Substances Control Act (TSCA) inventory list.   |
| WHMIS Classification (Canada) | CLASS B-4: Flammable solid.<br>CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).<br>On NDSL.  |
| EINECS Number (EEC)           | 247-317-2  |
| EEC Risk Statements           | R10- Flammable.<br>R18- In use, may form flammable/explosive vapor-air mixture.<br>R26/27/28- Very toxic by inhalation, in contact with skin and if swallowed.<br>R36/37/38- Irritating to eyes, respiratory system and skin.<br>R50- Very toxic to aquatic organisms.<br>R53- May cause long-term adverse effects in the aquatic environment. |
| Japanese Regulatory Data      | Not available.   |

**Continued on Next Page****Emergency phone number (800) 424-9300**

**Section XVI. Other Information****Version 1.0****Validated on 5/3/2007.****Printed 5/3/2007.****Notice to Reader**

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

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