Ludger

SAFETY DATA SHEET

Version: 2.0
Date written: 28 September 2011
Date reviewed: 10 October 2025

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/ UNDERTAKING

Product Name	**sodium cyanoborohydride**
Product Catalogue Name	**LT-CYANOB-01**
CAS-No.	**25895-60-7**
Company:	Ludger Ltd Culham Science Centre Abingdon Oxford OX14 3EB
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SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
Classification according to the Regulation (EC) No. 1272/2008 [EU-GHS/CLP]
Flammable solids (category 1)
Substances, which in contact with water emit flammable gases (category 1)
Acute toxicity, Oral (category 2)
Acute toxicity, Inhalation (category 2)
Acute toxicity, Dermal (category 2)
Skin corrosion (category 1B)
Serious eye damage (Category 1)
Acute aquatic toxicity (category 1)
Chronic aquatic toxicity (category 1)

2.2 Label elements

Signal Word: DANGER

Hazard Statement(s)

H228	Flammable solid
H260	In contact with water releases flammable gases which may ignite spontaneously.
H300	Fatal if swallowed.
H310	Fatal in contact with skin.
H314	Causes severe burns and eye damage.
H330	Fatal if inhaled.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P223	Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/spray.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3 Other hazard information

(EU)

EUH032 Contact with acids liberates a very toxic gas.

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. Stench.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3. 1 Substances

Synonyms: Sodium Cyanotrihydridoborate

Formula: CH_3BNNa

Component	Classification	Concentration
Sodium Cyanoborohydride		< = 100%
CAS-No. 25895-60-7		
EC-No. 247-317-2	Flam. Sol. 1; Water-react 1; Acute Tox. 2; Skin Corr. 1B; Eye Dam. 1; Aquatic Acute 1; Aquatic Chronic 1; H228, H260, H300, H330, H310, H314, H318, H400, H410 M-Factor - Aquatic Acute: 10 M-Factor - Aquatic Chronic: 10	

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

General Advice

Consult a physician if exposure causes ill effects and if in any doubt. Show this safety data sheet to the doctor/ first responder in attendance.

If swallowed

If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

If skin is exposed
Remove contaminated clothing/shoes immediately. Wash affected area(s) with water and soap.

If eyes are exposed
Wash eye(s) with plenty of water for at least 15 minutes; if unsure, seek medical advice.

If inhaled
Move into a source of fresh air; if not breathing, give artificial respiration.

4.2 Most important symptoms and effects, both acute and delayed
Burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting. To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated. Absorption into the body leads to the formation of methaemoglobin, which, in sufficient concentration, causes cyanosis. Onset may be delayed two to four hours or longer.

4.3 Indication of immediate medical attention and special treatment needed
No Data available

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
Foam Water

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Nitrogen oxides, Hydrogen cyanide (Hydrocyanic acid), Borane/boron oxides.

5.3 Advice for firefighters
Stay in a danger area only with a self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures.
Wear respiratory protection; gently sweep up to avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation, remove all sources of ignition. Evacuate personnel to a safe area; avoid breathing in dust/gas or mist.

6.2 Environmental Precautions
Prevent further leakage or spillage if safe to do so. Do not let the chemical enter the drainage system, and further discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain the spill with matting if necessary and then collect using either an electrically protected vacuum cleaner or by damp brushing (not wet) and putting the collected waste into a secure dry container; do not flush with water. Dispose of according to local regulations.

6.4 Reference to other sections
For disposal regulations, see section 13.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes, avoid formation of dust when handling. Provide appropriate exhaust ventilation in work areas where dust could be formed. Keep away from sources of ignition (No Smoking) and take measures to prevent the build up of electrostatic charge.

7.2 Conditions for safe storage, including any incompatibilities
Store in a cool place. Keep the container tightly closed in a dry and well ventilated place.
Never allow the product to get into contact with water during storage as it is moisture sensitive. Do not store near acids. Handle and open the container with care. Hygroscopic. Handle when open under an inert gas.

7.3 Specific end uses
No data available

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Component	CAS No	Value	Control parameters	Basis
Sodium Cyanoborohydride	25895-60-7	TWA	5 mg/mL	UK. EH40 WEL Workplace Exposure Limits
	Remarks	Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity.		

8.2 Exposure controls
Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash your hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/Face protection
Safety glasses are to be worn following good laboratory practice. Eye protection should be tested and approved under appropriate government standards such as EN 166 (EU) or NIOSH (US).

Skin protection
Handle with gloves at all times, following good laboratory practice. Gloves must be inspected before use and to be removed in proper glove removal technique (without touching the glove's outer surface) to avoid skin contact. Dispose of contaminated gloves after use as contaminated waste, in accordance with local regulations. Wash and dry your hands.
Gloves to be within the specifications of EU directive 89/686/EEC and the standard EN 374 derived from it.

Body protection
Laboratory coat or other protective laboratory clothing should be worn when handling the product.

Respiratory protection
Use an extraction unit/fume hood when using the product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance — Form: Powder

	Colour: Beige
Odour	No data available
Odour threshold	No data available
pH	No data available
Freezing/Melting Point	Melting point/range :> 242° C
Initial boiling point and boiling range	No data available
Flash Point	No data available
Evaporation rate	No data available
Flammability (solids and gases)	The substance or mixture is a flammable solid with the subcategory 1.
Upper/lower flammability or explosive limits	No data available
Vapour Pressure	No data available
Relative Density	No data available
Solubility in water and solvents	No data available
Partition coefficient	No data available
Autoignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available
Explosive properties	No data available
Oxidising properties	No data available

9.2 Other information
None available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
Forms explosive mixtures with air on intense heating. A range from approx. 15 Kelvin below the flash point is to be rated as critical. The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up, a dust explosion potential may generally be assumed. Contact with acids liberates a very toxic gas.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to Avoid
Do not allow water to enter the container because of a violent reaction.
Heat, flames and sparks. Extremes of temperature and direct sunlight. Exposure to sunlight.

10.5 Incompatible materials
Do not store near acids, oxidising agents.

10.6 Hazardous decomposition products
Reacts with water to form: - Hydrogen gas

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Acute toxicity
Acute toxicity estimate Oral - 5.1 mg/kg (Expert judgment)

Acute toxicity estimate Oral - 5.1 mg/kg (Expert judgment)
Acute toxicity estimate Inhalation - 4 h - 0.051 mg/l (Expert judgment)
Acute toxicity estimate Inhalation - 4 h - 0.051 mg/l (Expert judgment)
Acute toxicity estimate Dermal - 50.1 mg/kg (Expert judgment)
Acute toxicity estimate Dermal - 50.1 mg/kg (Expert judgment)

Skin corrosion/irritation
Causes skin burns.

Serious eye damage/irritation
Causes serious eye damage. Risk of blindness!

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available
Test Type: Ames test Test system: Escherichia coli/Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471 Result: negative

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as a probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
No data available

STOT (specific target organ toxicity) -single exposure
No data available

STOT (specific target organ toxicity) -repeated exposure
No data available

Aspiration hazard.
No data available

Potential health effects

Inhalation	May be fatal if inhaled. Material is extremely destructive to the tissue of the mucus membranes and the upper respiratory tract.
Ingestion	May be fatal if swallowed. Causes burns.
Skin	May be fatal if absorbed through the skin. Causes skin burns.
Eyes	Causes burns to the eyes.

As there is less than 10mg per vial, complete toxicological information is not available.

11.2 Additional Information
Endocrine-disrupting properties
Product:
Assessment: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and oedema of the larynx, spasm, inflammation and oedema of the bronchi, pneumonitis, and pulmonary oedema. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract, eyes, and skin., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. The following applies to boron compounds in general: resorption is followed by nausea and vomiting, agitation, spasms, CNS disorders, and cardiovascular disorders. The following applies to cyanogen compounds/ nitriles in general: utmost caution! Release of hydrocyanic acid is possible - blockade of cellular respiration. Cardiovascular disorders, dyspnoea, unconsciousness. Other dangerous properties can not be excluded. Handle in accordance with good industrial hygiene and safety practice..

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4. Mobility in soil
No data available

12.5. Results of PBT and vPvB assessment
No data available

12.6. Other adverse effects
Very toxic to aquatic life with long-lasting effects.

12.7 Endocrine-disrupting properties
Product:

Assessment	The substance/mixture does not contain components considered to have endocrine-disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Product or/and collected waste from spillage.
Burn in a chemical incinerator equipped with an afterburner and scrubber, but take extra precautions when igniting, as this material is highly flammable. Or to contact a licensed disposal company and arrange disposal, inform the company of the nature of the waste.

Contaminated packaging
Dispose of the unused product with a licensed disposal company.

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number
ADR/RID: 3132 IMDG: 3132 IATA: 3132

14.2 UN Proper Shipping Name
ADR/RID: WATER-REACTIVE SOLID, FLAMMABLE, N.O.S. (Sodium cyanotrihydroborate)
IMDG: WATER-REACTIVE SOLID, FLAMMABLE, N.O.S. (Sodium cyanotrihydroborate)
IATA: water-reactive solid, flammable, n.o.s. (Sodium cyanotrihydroborate)

14.3 Transport hazard class (es)
ADR/RID: 4.3 (4.1) IMDG: 4.3 (4.1) IATA: 4.3 (4.1)

14.4 Packing group
ADR/RID: I IMDG: I IATA: I

14.5 Environmental hazards
ADR/RID: yes IMDG Marine pollutant: yes IATA: No

14.6 Special precautions for the user
No data available

SECTION 15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific to the substance or mixture
No data available

15.2 Chemical Safety Assessment
No data available

SECTION 16. OTHER INFORMATION

The advice offered is derived from the currently available information on the hazardous materials in this product and it component(s). Consideration has been given to the quantities offered in the pre-dispensed container. The advice offered is, therefore, not all-inclusive nor should it be taken as the description of the compound generally.