


**MATERIAL SAFETY DATA SHEET (MSDS)  
according to Regulation (EC) No. 1907/2006  
Version 2.0 Revision Date 01.06.2015**

## 1.0 Identification of the substance/preparation and of the company/enterprise

- 1.1 Product identifiers** Sodium cyanoborohydride (SCBH)  
**EINECS** 247-317-2  
**CAS** 25895-60-7  
**RTECS** no data available
- 1.2 Relevant identified uses of the substance or mixture and uses advised against**  
 In organic synthesis as a highly selective reducing agent. Sodium cyanoborohydride selectively reduces aldehydes, ketones and oximes in acidic media at pH 3 - 4 not affecting other functional groups as amides, ethers, nitriles, nitro compounds and epoxides in various reaction conditions.
- 1.3 Details of the supplier of the safety data sheet**  
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- 1.4 Emergency telephone number** (+7)-8313-249 750/ 630

## 2.0 Hazards Identification

- 2.1 Classification of the substance or mixture**  
 Light amorphous highly hygroscopic powder, white or slightly yellowish. Highly toxic by inhalation. Has an irritating skin-resorption effect. Fire hazardous. Explosion hazardous on contact with oxidizers and acids. No manipulations with the product are allowed till safety measures recommended by the producer are studied and mastered.  
**Regulation (EC) No 1272/2008 Annex VI Table**

Classification		Labelling		
Hazard Class and Category Code(s)	Hazard Statement Code(s)	Pictogram Signal Word Code(s)	Hazard Statement Code(s)	Suppl. Hazard statement code(s)
Water-react. 1	H260	 Danger	H260	
Acute toxicity, Oral, 2	H300		H300	
Acute toxicity, Ing, 2	H310		H310	
Acute toxicity, Derm., 2	H330		H330	
Skin corrosion, 1B	H314		H314	

## 2.2 Label elements

### Hazard statement(s)

- 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 skin burns and eye damage.  
 H330 Fatal if inhaled.

**Precautionary statement(s)**

P231 + P232 Handle under inert gas. Protect from moisture.  
 P260 Do not breathe dust/fume/gas/mist/vapors/spray.  
 P264 Wash hands thoroughly after handling.  
 P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.  
 P422 Store contents under inert gas.

**3.0 Composition/information on ingredients**

<b>Sodium cyanoborohydride</b>	96.0% min.
Trade names/Synonyms	Sodium cyanotrihydroborate
EINECS	247-317-2
CAS-No.	25895-60-7
Chemical formula	NaBH <sub>3</sub> CN
Molar mass	62.84
Melting point	≥ 242°C with decomposition
Classification	: Water-react. 1; Acute Tox. Oral. 2; Acute Tox. Ing. 2; Acute Tox. Derm. 2; Skin corrosion, 1B H260, H300, H310, H330, H314
<b>Sodium hydride</b>	< 4.0%
CAS-No.	7646-69-7
EINECS	231-587-3
Chemical formula	NaH
Molar mass	23.99
Classification	: Flam. Solid 1; Skin cor. 1A; Sub/mix., which in contact with water, emit flammable gases 1 H228, H314, H260

**4.0 First Aid Measures****4.1 Description of first aid measures**

CALL FOR A MEDICAL SERVICE IN ALL CASES.  
 THE PRODUCT MAY CAUSE INTOXICATION AND BURNS!

Remove a victim to fresh air, take off contaminated clothes, provide for rest and warmth, start antidote treatment (let inhale amyl nitrite). Oxygen inhalation in case of hard breathing. Artificial respiration in case of respiratory standstill. Urgent admission to a hospital.

**After skin contact**

Immediately wash the skin with plenty of water, remove contaminated clothes, then wash the skin with warm water and soap.

**After eyes contact**

Immediately wash with plenty of water for 15 minutes with the eyelids held open. Treat the eyes with local anesthetics. Immediately call for an eye specialist.

**After ingestion/inhalation**

If inhaled remove a victim to fresh air, take off contaminated clothes, provide for rest and warmth, immediately start an antidote treatment with methemoglobin formers, thiosulphates and organocobalt compounds. Urgent admission to a hospital.

**4.2 Most important symptoms and effects, both acute and delayed**

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**4.3 Indication of immediate medical attention and special treatment needed**

no data available

**5.0 Fire Fighting Measures****5.1 Extinguishing media**

**Suitable extinguishing media**

Dry sand, dry powder fire extinguishers, for closed systems and spaces use nitrogen or an inert gas.

**Extinguishing equipment**

Full protective clothing including protective gloves and boots. For respiratory protection wear a NIOSH/MSHA approved self-contained breathing apparatus with full facepiece operated in a positive-pressure mode.

**Unsuitable extinguishing media**

Do not use water, it results in the formation of highly toxic solutions.

**5.2 Special hazards arising from the substance or mixture**

Sodium cyanoborohydride is combustible, ignites in open flame (fire). Heating to a temperature higher than 242°C causes decomposition followed by hydrogen emission.

Explosive when in contact with oxidants and acids.

**5.3 Precautions for fire-fighters**

Wear self-contained breathing apparatus for fire fighting if necessary.

**6.0 Accidental Release Measures****6.1 Personal precautions, protective equipment and emergency procedures**

Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

**6.2 Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

**6.3 Methods and materials for containment and cleaning up**

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections**

For disposal see section 13.

**7.0 Handling and Storage****7.1 Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking.

**7.2 Conditions for safe storage, including any incompatibilities**

Keep container tightly closed in a dry and well-ventilated place. Store in cool place.

Never allow product to get in contact with water during storage.

Store under inert gas. Hygroscopic. Handle and store under inert gas.

**8.0 Exposure Control and Personal Protection****8.1 Control parameters****Components with workplace control parameters****8.2 Exposure controls****Normal use and handling**

To protect respiratory organs use a NIOSH/MSHA approved self-contained breathing apparatus with full facepiece operated in a positive-pressure mode.

**When working with the unpacked product**

To protect hands use rubber gloves resistant to acids and alkalis. To protect eyes use closely fitting goggles. When handling provide an efficient ventilation of the working area. Keep the product away from food, beverages and tobacco. Keep working clothes separately, regularly wash them.

**In case of emergency**

Use a full protective clothing including gloves and boots. To protect the eyes and respiratory

organs use NIOSH/MSHA approved self-contained breathing apparatus with full facepiece operated in a positive-pressure mode.

#### Exposure limits

The estimated permissible concentration level is 0.3 mg/m<sup>3</sup>

## 9.0 Physical and Chemical Properties

### 9.1 Information on basic physical and chemical properties

Form	: powder
Colour	: white or yellowish
Odour	: none

#### Safety related information

pH of Aqueous solution (10%)	: 8 – 9
pH of 5M Aqueous solution in 1M solution of NaOH	: 14
Critical temperature	: not available
Boiling point	: not available
Flash point	: not available
Flammability	: not available
Oxidizing properties	: not available
Explosive properties	: not available
Lower limit of the melting range	: not available
Vapour pressure	: not available
Partition coefficient	: not available
Viscosity	: not available
Vapor density	: not available
Density	: not available
Decomposition temp.	: not available
Surface tension	: not available
Conductivity	: not available
Enthalpy of Vaporization	: not available
Solubility in water, g/100g	: 212 at 29°C : 181 at 52°C : 121 at 68°C
Solubility in THF, g/100g	: 37.2 at 28°C : 41.0 at 46°C : 42.2 at 62°C

### 9.2 Other safety information

Ignition temperature	: 175°C
Melting point	: ≥242°C with decomposition

Sodium cyanoborohydride is readily soluble in methanol, slightly soluble in ethanol, non-soluble in diethyl ether, benzene, hexane.

## 10.0 Stability and Reactivity

### 10.1 Reactivity

no data available

### 10.2 Chemical stability

The product is rather thermally stable, in a sealed capillary it starts to decompose at a temperature no less than 242°C, however it is highly hygroscopic. The product should be handled in a dry nitrogen or other inert gas atmosphere (in drums, in apparatus).

### 10.3 Possibility of hazardous reactions

Vigorously reacts with oxidizers, when contacting with acids evolves hydrogen (danger of fire, explosion).

**10.4 Conditions to avoid**

Do not allow water to enter container because of violent reaction. Exposure to moisture.

**10.5 Incompatible materials**

Do not store near acids, oxidizing agents

**10.6 Hazardous decomposition products**

Hydrogen, hydrogen cyanide (danger of poisoning).

**11.0 Toxicological Information****11.1 Information on toxicological effects****Acute toxicity**

No data available

**Skin corrosion/ irritation**

No data available

**Serious eye damage/ eye irritation**

No data available

**Respiratory or skin sensitization**

No data available

**Germ cell mutagenicity**

No data available

**Reproductive toxicity**

No data available

**Specific target organ toxicity – single exposure**

No data available

**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 mucous membranes and upper respiratory tract.

**Ingestion** : May be fatal if swallowed. Causes burns.

**Skin** : May be fatal if absorbed through skin. Causes skin burns.

**Eyes** : Causes eye burns.

**Additional Information**

RTECS: no data available

Sodium cyanoborohydride is highly dangerous when inhaled, has an irritant skin-resorption effect. The estimated permissible concentration level is 0.3 mg/m<sup>3</sup>.

Hazard class II with «+» mark, special protection of skin and eyes is required.

Acute intoxication with sodium cyanoborohydride may cause indisposition, dizziness, sweating, nausea, dyspepsia, tachycardia.

First-aid measures and further treatment - see sec.4.

**12.0 Ecological Information**

**12.1 Toxicity** : not available

**12.2 Persistence and degradability** : not available

**12.3 Bioaccumulative potential** : not available

**12.4 Mobility in soil** : not available

**12.5 PBT and vPvB assessment** : not available

**12.6 Other adverse effects** : not available

**13.0 Disposal Consideration****13.1 Waste treatment methods****Product**

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in

igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging** : Dispose of as unused product.

#### 14.0 Transport Information

##### 14.1 UN-Number

3134

##### 14.2 UN proper shipping name

Water-reactive solid, toxic, n.o.s. (Sodium cyanoborohydride)

##### 14.3 Transport hazard class(es)

GGVS/GGVE/ADR/RID: 4.3, Hazard Identification: none, Classification: WT2, Tunnel Code: (E)

IMO/GGVSee: 4.3(6.1), MFAG: 4.2, EmS: F-G, S-N, Stowage category: D

ICAO/IATA: 4.3(6.1), PAX: F, CAO: 488

##### 14.4 Packaging group

GGVS/GGVE/ADR/RID: I                      IMO/GGVSee: I                      ICAO/IATA: I

##### 14.5 Environmental hazards

GGVS/GGVE/ADR/RID: No                      IMO/GGVSee: No                      ICAO/IATA: No

##### 14.6 Special precautions for user

See section 7.0

##### 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

The substance is not intended to be transported in bulk.

#### 15.0 Regulatory Information

##### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

no data available

##### 15.2 Chemical Safety Assessment

no data available

#### 16.0 Other Information

*NOTE: THIS IS A HAZARDOUS CHEMICAL PRODUCT.*

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