

## MATERIAL SAFETY DATA SHEET (MSDS)

according to Regulation (EC) No. 1907/2006

Version 1.1 Revision Date 17.07.2014




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

- 1.1 Product identifiers** Sodium borohydride  
**EINECS** 241-004-4  
**CAS** 16940-66-2  
**RTECS** ED3325000
- 1.2 Relevant identified uses of the substance or mixture and uses advised against**  
 Selective reduction of aldehyde and ketone groups in pharmacy and in fine organic chemistry.
- 1.3 Details of the supplier of the safety data sheet**  
 JSC AVIABOR, Nizhny Novgorod Region  
 606000 Dzerzhinsk, Russia  
 Tel: (+7)-8313-249 727, Fax: (+7)-8313-249 767  
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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

**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 Acute Tox.dem. 3 Acute Tox.oral 3 Skin corrosion 1B	H260 H301 H311 H314	   Danger	H260 H301 H311 H314	

#### 2.2 Label elements

##### **Hazard statement(s)**

- H260 In contact with water releases flammable gases which may ignite spontaneously.  
 H301 Toxic if swallowed.  
 H311 Toxic in contact with skin.  
 H314 Causes severe skin burns and eye damage.

##### **Precautionary statement(s)**

- P223 Keep away from any possible contact with water, because of violent reaction and possible flash fire.  
 P231 + P232 Handle under inert gas. Protect from moisture.  
 P280 Wear protective gloves/protective clothing/eye protection/face protection.  
 P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.  
 P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.  
 P422 Store contents under inert gas.

## According to European Directive 67/548/EEC as amended, Table

Classification	Risk phrases	Safety phrases	Indication(s) of danger
F	15	22	F
T	24/25	26	T
	34	36/37/39	
		43	
		45	

**R-Phrase:**

R 15 Contact with water liberates extremely flammable gases.

R24/25 Toxic in contact with skin and if swallowed.

R34 Causes burns.

**S-Phrase:**

S22 Do not breathe dust.

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S43 In case of fire use sand.

S45 In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

Symbol(s):



Contact with water, emits flammable gas



Toxic

**2.3 Other hazards - none****3.0 Composition / information on ingredients****Sodium borohydride** 100 wt%**Trade names/Synonyms** Sodium tetrahydridoborate, Sodium boranate**Chemical formula** NaBH<sub>4</sub>**Molar mass** 37.83**Classification:**

R &amp; S-Phrases: R 15, 24/25, 34

S 22, 26, 36/37/39, 43, 45

**CAS-No.** 16940-66-2**EINECS** 241-004-4**RTECS** ED3325000**IUPAC** Sodium borohydride**4.0 First Aid Measures****4.1 Description of first aid measures****General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

Consult a physician.

**In case of skin contact**

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water.

Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**

Do NOT induce vomiting. Never give anything by mouth to an unconscious person.  
Rinse mouth with water. Consult a physician.

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

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, cough, 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.

**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 powder, Carbon dioxide (CO<sub>2</sub>)

**Unsuitable extinguishing media**

Water

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

Nature of decomposition products not known.

**5.3 Precautions for fire-fighters**

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

**5.4 Further information**

no data available

**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.

**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**

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

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

Air and moisture sensitive. Store under inert gas.

**7.3 Specific end uses**

no data available

**8.0 Exposure Control and Personal Protection****8.1 Control parameters**

Components with workplace control parameters

**8.2 Exposure controls, Appropriate engineering controls**

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

**Personal protective equipment****Eye/face protection**

Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

**Body Protection**

Complete suit protecting against chemicals. Flame retardant protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator. If the respirator is the sole means of protection, use a full-face supplied air respirator.

**9.0 Physical and Chemical Properties****9.1 Information on basic physical and chemical properties**

Form	: powder or granular
Colour	: white
Odour	: none
pH	: 11 (10 g/l H <sub>2</sub> O, 20°C)
BP/BP Range	: 500°C
MP/MP Range	: 400°C
Flash Point	: 187°C
Flammability	: N/A
Autoignition Temp.	: N/A
Oxidizing Properties	: N/A
Explosive Properties	: N/A
Explosion Limits Lower	: 3.02 %
Vapor Pressure	: N/A
SG/Density	: 1.07 g/cm <sup>3</sup>
Partition Coefficient	: N/A
Viscosity	: N/A
Vapor Density	: N/A
Saturated Vapor Conc.	: N/A
Evaporation Rate	: N/A
Decomposition Temp.	: N/A
Solvent Content	: does not contain
Water Content	: does not contain
Surface Tension	: N/A
Conductivity	: N/A
Miscellaneous Data	: N/A
Solubility	: 55 g/l H <sub>2</sub> O at 25°C; not soluble in oils

**9.2 Other safety information**

Bulk Density	: 0.4-0.7 g/cm <sup>3</sup>
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**10.0 Stability and Reactivity****10.1 Reactivity**

no data available

**10.2 Chemical stability**

no data available

**10.3 Possibility of hazardous reactions**

Reacts violently with water.

**10.4 Conditions to avoid**

Exposure to moisture.

**10.5 Incompatible materials**

Oxidizing agents, chemically active metals, acids. Reacts violently with water.

**10.6 Hazardous decomposition products**

Other decomposition products - no data available

**11.0 Toxicological Information****11.1 Information on toxicological effects****RTECS** : ED3325000**Acute toxicity** : LD<sub>50</sub> (oral, rat) 162 mg/kg

Remarks: Sense organs and special senses (nose, eye, ear, and taste): Eye: Other. Behavioral: Convulsions or effect on seizure threshold. Lungs, thorax, or respiration: Structural or functional change in trachea or bronchi. LC<sub>50</sub> (inhalation, rat) 36 mg/m<sup>3</sup>

Remarks: Sense organs and special senses (nose, eye, ear, and taste): Eye: Other. Behavioral: Convulsions or effect on seizure threshold. Lungs, thorax, or respiration: Structural or functional change in trachea or bronchi. LD<sub>50</sub> (intraperitoneal, rat) 18 mg/kg  
LD<sub>50</sub> (subcutaneous, rat) 177 mg/kg

Remarks: Sense organs and special senses (nose, eye, ear, and taste): Eye: Other. Behavioral: Convulsions or effect on seizure threshold. Lungs, thorax, or respiration: Structural or functional change in trachea or bronchi. LD<sub>50</sub> (oral, mouse) 50 mg/kg

Remarks: Sense organs and special senses (nose, eye, ear, and taste): Eye : Other. Behavioral: Convulsions or effect on seizure threshold. Lungs, thorax, or respiration: Structural or functional change in trachea or bronchi. LD<sub>50</sub> (oral, rabbit) 50 mg/kg

Remarks: Sense organs and special senses (nose, eye, ear, and taste): Eye: Other. Behavioral: Convulsions or effect on seizure threshold. Lungs, thorax, or respiration: Structural or functional change in trachea or bronchi. LD<sub>50</sub> (skin, rabbit) 230 mg/kg

Remarks: Sense organs and special senses (nose, eye, ear, and taste): Eye: Other. Behavioral: Convulsions or effect on seizure threshold. Lungs, thorax, or respiration: Structural or functional change in trachea or bronchi.

**Signs and symptoms of exposure:**

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

**Inhalation** may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Route of exposure**

**Skin contact:** Causes irritation with an intense burning sensation and redness.

**Skin absorption:** Toxic if absorbed through skin.

**Eye contact:** Causes burns.

**Inhalation:** May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

**Ingestion:** Is not a possible route of absorption but may cause severe abdominal pain with diarrhea and vomiting. Depression of the central nervous system with headache, dizziness, somnolence, muscle weakness, lack of coordination, fatigue, vision and speech disorders, tremor and convulsions.

**12.0 Ecological Information****12.1 Toxicity**

Toxicity to fish mortality LC<sub>50</sub> - Gambusia affinis (Mosquito fish) - 5.600 mg/l - 96 h

**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**

no data available

**13.0 Disposal Considerations****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**

1426

**14.2 UN proper shipping name**

Sodium borohydride

**14.3 Transport hazard class(es)**

GGVS/GGVE/ADR/RID: 4.3, Hazard Identification: none, Classification: W2, Tunnel Code: (E)

IMO/GGVSee: 4.3, MFAG: 245, EmS: F-G, S-O, Stowage: E

ICAO/IATA: 4.3, PAX: F, CAO: 487

**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**

This material safety data sheet was prepared in compliance with laws, regulations and administrative provisions relative to classification, packaging and labelling of dangerous substances and preparations.

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