

Material Safety Data Sheet

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Version 1.3

According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

1 - Product and Company Information

Product Name	SODIUM BOROHYDRIDE, REAGENTPLUS(TM), 99%
Product Number	213462
Company	Sigma-Aldrich Pty, Ltd Unit 2, 14 Anella Avenue Castle Hill NSW 1765 Australia
Technical Phone #	+61 2 9841 0555
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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
SODIUM BOROHYDRIDE	16940-66-2	241-004-4	None

Formula	NaBH ₄
Molecular Weight	37.83 AMU
Synonyms	Borohydrure de sodium (French) * Borol * Hidkitex DF * Sodium borohydrate * Sodium hydroborate * Sodium tetrahydridoborate(1-) * Sodium tetrahydroborate(1-) * Sodium tetrahydridoborate

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Contact with water liberates extremely flammable gases. Toxic in contact with skin and if swallowed. Causes burns.

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

CONDITIONS OF FLAMMABILITY

Reacts with water to liberate flammable and/or explosive gas.
Reacts with metals to liberate flammable hydrogen gas.

EXTINGUISHING MEDIA

Suitable: Dry chemical powder.

Unsuitable: Do not use water, foam, or carbon dioxide. Do not use halocarbon extinguishers.

SPECIAL RISKS

Specific Hazard(s): Flammable solid. Emits toxic fumes under fire conditions.

Explosion Hazards: Material readily reacts with water generating flammable and/or explosive hydrogen gas

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed. Store in a cool dry place.

Incompatible Materials: Do not allow contact with water Sodium borohydride in dimethylformamide (DMF) will undergo runaway thermal reactions resulting in violent decompositions. An induction period is involved and it is temperature dependent, e.g., 45 hours at 62°C and 45 minutes at 90°C. The temperature can reach the autoignition temperature (190°C) of trimethylamine, the reaction byproduct. The addition of supported noble metal catalysts to solutions of sodium borohydride can result in ignition of liberated hydrogen gas. The reduction of ruthenium salts solutions with borohydride solutions to give the metal or an alloy gave solid products which were dried and subsequently exploded when disturbed by a spatula or on contact with water

SPECIAL REQUIREMENTS: Reacts violently with water. Heat sensitive.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

Skin Protection: Chemical resistant apron.

Special Protective Measures: Faceshield (8-inch minimum).

9 - Physical and Chemical Properties

Appearance	Physical State: Solid Color: White	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	400 °C	
Flash Point	N/A	
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/cm3	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions to Avoid: Do not allow water to enter container because of violent reaction. Heat.

Materials to Avoid: Chemically active metals, Oxidizing agents, Acids Reacts violently with water.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Borane/boron oxides, Sodium oxide, Hydrogen gas.

Hazardous Decomposition Products Formed Upon Contact with Water: Material readily reacts with water generating flammable and/or explosive hydrogen gas

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

ACUTE TOXICITY

LD50
Skin
Rabbit
★

LD50
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.

LC50
Inhalation
Rat
36 mg/m3
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.

LD50
Intraperitoneal
Rat
18 MG/KG

LD50
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.

LD50
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.

LD50
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.

LD50
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 burns.

Skin Absorption: Toxic if absorbed through skin.

Eye Contact: Causes burns.

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

Ingestion: Toxic if swallowed.

12 - Ecological Information

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 1426

Class: 4.3

PG: I

Proper Shipping Name: Sodium borohydride

IMDG

UN#: 1426

Class: 4.3

PG: I

Proper Shipping Name: Sodium borohydride

Marine Pollutant: No

Severe Marine Pollutant: No

IATA

UN#: 1426

Class: 4.3

PG: I

Proper Shipping Name: Sodium borohydride

Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

INDICATION OF DANGER: F T

Highly Flammable. Toxic.

R-PHRASES: 15 24/25 34

Contact with water liberates extremely flammable gases. Toxic in contact with skin and if swallowed. Causes burns.

S-PHRASES: 22 26 36/37/39 43 45

Do not breathe dust. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of fire, use dry sand. Never use water. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 2

SWITZERLAND

SWISS POISON CLASS: 3

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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