Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 05/13/2010 Reviewed on 05/12/2010

1 Identification of substance:

Product details:

Product name: Sodium borohydride

Stock number: 35788

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Sodium borohydride (CAS# 16940-66-2)
Identification number(s):
EINECS Number: 241-004-4

3 Hazards identification

Hazard description:

T Toxic
F Highly flammable

Information pertaining to particular dangers for man and environment
R 15 Contact with water liberates extremely flammable gases.
R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
R 34 Causes burns.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH	3
FIRE	2
REACTIVITY	2

Health (acute effects) = 3
Flammability = 2
Reactivity = 2

GHS label elements

Danger

3.1/3 - Toxic if swallowed.
3.1/3 - Toxic in contact with skin.
3.1/3 - Toxic if inhaled.

Danger

3.2/1B - Causes severe skin burns and eye damage.

Warning

2.12/3 - In contact with water releases flammable gas.
Prevention:
Wear protective gloves/protective clothing/eye protection/face protection.
Response:
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor/physician.

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Product name: Sodium borohydride

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In case of fire: Use for extinction: Fire-extinguishing powder.

Storage:

Store in a dry place. Store in a closed container.

4 First aid measures

General information

Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing has been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing

Do not induce vomiting; immediately call for medical help.
Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents

Dry sand
Extinguishing powder. Do not use water.

For safety reasons unsuitable extinguishing agents

Water
Carbon dioxide

Special hazards caused by the material, its products of combustion or resulting gases:

In case of fire, the following can be released:
Sodium oxide
Boron oxide

Protective equipment:

Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:

Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources

Measures for environmental protection:

Do not allow material to be released to the environment without proper governmental permits.

Measures for cleaning/collecting:

Use neutralizing agent.
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents
Keep away from ignition sources.

Additional information:

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling

Information for safe handling:

Handle under dry protective gas.
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Open and handle container with care.

Information about protection against explosions and fires: Keep ignition sources away.

Storage

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:

Store away from oxidizing agents.

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Store away from water/moisture.
Do not store together with acids.
Further information about storage conditions:
Store under dry inert gas.
This product is moisture sensitive.
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Protect from humidity and water.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace: Not required.
Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality.
Quality will vary from manufacturer to manufacturer.
Eye protection:
Safety glasses
Tightly sealed goggles
Full face protection
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information	
Form:	Powder
Color:	White
Odor:	Odorless
Change in condition	
Melting point/Melting range:	400°C (752°F) (dec)
Boiling point/Boiling range:	Not determined
Sublimation temperature / start:	Not determined
Flash point:	Not applicable
Flammability (solid, gaseous)	Contact with water liberates extremely flammable gases.
Ignition temperature:	220°C (428°F)
Decomposition temperature:	Not determined
Explosion limits:	
Lower:	3.02 Vol %
Upper:	Not determined
Vapor pressure:	Not determined
Density at 20°C (68°F):	1.074 g/cm³
Solubility in / Miscibility with	
Water at 25°C (77°F):	550 g/l Contact with water releases flammable gases
pH-value (10 g/l) at 20°C (68°F):	11

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10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided:
Water/moisture
Reducing agents
Oxidizing agents
Acids
Hydrogen chloride (HCl)
Hydrogen bromide (HBr)
Dangerous reactions Contact with water releases flammable gases
Dangerous products of decomposition:
Sodium oxide
Boron oxide

11 Toxicological information

Acute toxicity:

LD/LC50 values that are relevant for classification:		
Oral	LD50	50 mg/kg (mouse) (RTECS)
		162 mg/kg (rat) (RTECS)
Dermal	LD50	230 mg/kg (rabbit) (RTECS)
Inhalative	LC50	36 mg/m3 (rat) (RTECS)

Primary irritant effect:
on the skin: Corrosive effect on skin and mucous membranes.
on the eye: Strong corrosive effect.
Sensitization: No sensitizing effects known.
Subacute to chronic toxicity:
Subacute to chronic toxicity:
The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:
Sense Organs and Special Senses (Eye) - effect, not otherwise specified.
Behavioral - convulsions or effect on seizure threshold.
Lungs, Thorax, or Respiration - structural or functional change in trachea or bronchi.
Cardiac - pulse rate.
Vascular - BP lowering not characterized in autonomic section.
Nutritional and Gross Metabolic - weight loss or decreased weight gain.
Subacute to chronic toxicity:
Boron affects the central nervous system. Boron poisoning causes depression of the circulation, persistant vomiting and diarrhea, followed by profound shock and coma. The temperature may become subnormal and a scarletina form rash may cover the entire body. Corrosive materials are acutely destructive to the respiratory tract, eyes, skin and digestive tract. Eye contact may result in permanent damage and complete vision loss. Inhalation may result in respiratory effects such as inflammation, edema, and chemical pneumonitis. May cause coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. Ingestion may cause damage to the mouth, throat and esophagus. May cause skin burns or irritation depending on the severity of the exposure.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
Danger through skin absorption.
Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
EPA-I: Data are inadequate for an assessment of human carcinogenic potential.

12 Ecological information:

Additional ecological information:
General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation Consult state, local or national regulations to ensure proper disposal.

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Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

DOT regulations:

Hazard class:	4.3
Identification number:	UN1426
Packing group:	I
Proper shipping name (technical name):	SODIUM BOROHYDRIDE
Label	4.3

Land transport ADR/RID (cross-border)

ADR/RID class:	4.3 (W2) Substances which, in contact with water, emit flammable gases
Danger code (Kemler):	-
UN-Number:	1426
Packaging group:	I
Description of goods:	1426 SODIUM BOROHYDRIDE

Maritime transport IMDG:

IMDG Class:	4.3
UN Number:	1426
Label	4.3
Packaging group:	I
Marine pollutant:	No
Proper shipping name:	SODIUM BOROHYDRIDE

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class:	4.3
UN/ID Number:	1426
Label	4.3
Packaging group:	I
Proper shipping name:	SODIUM BOROHYDRIDE

UN "Model Regulation": UN1426, SODIUM BOROHYDRIDE, 4.3, I

15 Regulations

Product related hazard informations:

Hazard symbols:
T Toxic
F Highly flammable

Risk phrases:
15 Contact with water liberates extremely flammable gases.
23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
34 Causes burns.

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Safety phrases:

7/8 Keep container tightly closed and dry.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
43 In case of fire, use powdered extinguishing agent. Never use water.
45 In case of accident or if you feel unwell, seek medical advice immediately.

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use: For use only by technically qualified individuals.

16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact: Zachariah Holt
Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent