



Material Safety Data Sheet

NFPA 	HMIS <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td style="background-color: #00FFFF;">Health Hazard</td><td style="text-align: center; border-radius: 50%;">3</td></tr> <tr><td style="background-color: #FFC0CB;">Fire Hazard</td><td style="text-align: center; border-radius: 50%;">3</td></tr> <tr><td style="background-color: #FFFF00;">Reactivity</td><td style="text-align: center; border-radius: 50%;">2</td></tr> </table>	Health Hazard	3	Fire Hazard	3	Reactivity	2	Personal Protective Equipment  See Section 15.
Health Hazard	3							
Fire Hazard	3							
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Section 1. Chemical Product and Company Identification		Page Number: 1
Common Name/Trade Name	Sodium borohydride	
	Catalog Number(s)	YY1013, S1187
	CAS#	16940-66-2
Manufacturer	SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248	
	RTECS	ED3325000
	TSCA	TSCA 8(b) inventory: Sodium borohydride
Commercial Name(s)	Borol	
	CI#	Not available.
Synonym	Sodium tetrahydroborate; Sodium tetrahydroborate (1-); Sodium tetrahydridoborate (1-); Sodium Hydroborate; Sodium Borohydrate	
Chemical Name	Borate (1-), tetrahydro-, sodium	
Chemical Family	Not available.	
Chemical Formula	NaBH ₄	
Supplier	SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248	
<u>IN CASE OF EMERGENCY</u> <u>CHEMTREC (24hr) 800-424-9300</u> CALL (310) 516-8000		

Section 2. Composition and Information on Ingredients					
Name	CAS #	Exposure Limits			% by Weight
		TWA (mg/m ³)	STEL (mg/m ³)	CEIL (mg/m ³)	
1) Sodium borohydride	16940-66-2				100
Toxicological Data on Ingredients	Sodium borohydride: ORAL (LD50): Acute: 160 mg/kg [Rat]. 50 mg/kg [Mouse]. 50 mg/kg [Rabbit]. DERMAL (LD50): Acute: 230 mg/kg [Rabbit].				

Section 3. Hazards Identification	
Potential Acute Health Effects	Very hazardous in case of skin contact (irritant), of eye contact (irritant). Hazardous in case of skin contact (permeator), of ingestion, of inhalation. Slightly hazardous in case of skin contact (corrosive), of eye contact (corrosive). The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects	<p>CARCINOGENIC EFFECTS: Not available.</p> <p>MUTAGENIC EFFECTS: Not available.</p> <p>TERATOGENIC EFFECTS: Not available.</p> <p>DEVELOPMENTAL TOXICITY: Not available.</p> <p>The substance may be toxic to mucous membranes, peripheral nervous system, skin, eyes, central nervous system (CNS).</p> <p>Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.</p>
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Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Serious Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Serious Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Serious Ingestion	Not available.

Section 5. Fire and Explosion Data

Flammability of the Product	Flammable.
Auto-Ignition Temperature	Not available.
Flash Points	Not available.
Flammable Limits	Not available.
Products of Combustion	Some metallic oxides.
Fire Hazards in Presence of Various Substances	Highly flammable in presence of open flames and sparks, of heat. Flammable in presence of oxidizing materials. Slightly flammable to flammable in presence of moisture.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of moisture.
Fire Fighting Media and Instructions	Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.
Special Remarks on Fire Hazards	Produces flammable gas on contact with water. May ignite on contact with water or moist air. When heated to decomposition it emits toxic fumes.
Special Remarks on Explosion Hazards	May react vigorously or explosively on contact with water. Dry mixtures with sodium hydroxide containing 15-40% sodium hydroboride liberate hydrogen explosively at 230-270 C. Addition of 4% solution of sodium borohydride in diglyme containing 0.09% water to a 27% solution of aluminum chloride in the same solvent lead to a violent explosion, attributed to formation and ignition of hydrogen. Hot solutions of Sodium borohydride (15.7% wt) in dimethylformamide will undergo a violent runaway thermal decomposition. When dimethylformamide containing 2.6% formic acid is added to Sodium borohydride at ambient temperature, immediate and violent decomposition ensues involving formation of sodium formoxytrihydroborate.

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Use of Sodium borohydride solutions to reduce ruthenium salt solutions to the metal or an alloy gives solid products (possibly hydrides), which when dry, explode violently in contact with water or when disturbed by a spatula.

Section 6. Accidental Release Measures

Small Spill	Use appropriate tools to put the spilled solid in a convenient waste disposal container.
Large Spill	Poisonous solid. Flammable solid that, in contact with water, emits flammable gases. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Cover with dry earth, sand or other non-combustible material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal.

Section 7. Handling and Storage

Precautions	Keep under inert atmosphere. Keep container dry. Do not ingest. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, moisture.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area. Keep from any possible contact with water. Do not allow water to get into container because of violent reaction. Moisture sensitive. Dangerous when wet.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	Not available.

Section 9. Physical and Chemical Properties

Physical state and appearance	Solid. (Powdered solid. Crystalline powder.)	Odor	Not available.
Molecular Weight	37.84 g/mole	Taste	Not available.
pH (1% soln/water)	Not available.	Color	White. Grayish white.
Boiling Point	Decomposition temperature: 400°C (752°F)		
Melting Point	36°C (96.8°F)		
Critical Temperature	Not available.		
Specific Gravity	1.074 (Water = 1)		
Vapor Pressure	Not applicable.		
Vapor Density	1.3 (Air = 1)		
Volatility	Not available.		
Odor Threshold	Not available.		
Water/Oil Dist. Coeff.	Not available.		
Ionicity (in Water)	Not available.		
Dispersion Properties	See solubility in water, methanol.		

Solubility	Easily soluble in hot water. Soluble in cold water. Partially soluble in methanol. Insoluble in diethyl ether.
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Section 10. Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	Incompatible materials, water, moisture, moist air.
Incompatibility with various substances	Highly reactive with oxidizing agents. Reactive with acids, moisture. The product reacts violently with water to emit flammable but non toxic gases.
Corrosivity	Non-corrosive in presence of glass.
Special Remarks on Reactivity	Moisture sensitive. Dangerous when wet. Decomposes slowly at 400C and rapidly at 500 C. Produces flammable hydrogen gas on contact with water. May ignite on contact with water or moist air. May react vigorously or explosively on contact with water. On contact with acids/acid fumes, it can emit flammable vapors. Incompatible with Sodium Hydroxide, diglyme, dimethyl formamide, ruthenium salt (solutions), sulfuric acid, metal salts, palladium.
Special Remarks on Corrosivity	Not available.
Polymerization	Will not occur.

Section 11. Toxicological Information

Routes of Entry	Absorbed through skin. Eye contact. Inhalation. Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 50 mg/kg [Rabbit]. Acute dermal toxicity (LD50): 230 mg/kg [Rabbit].
Chronic Effects on Humans	May cause damage to the following organs: mucous membranes, peripheral nervous system, skin, eyes, central nervous system (CNS).
Other Toxic Effects on Humans	Very hazardous in case of skin contact (irritant). Hazardous in case of skin contact (permeator), of ingestion, of inhalation. Slightly hazardous in case of skin contact (corrosive), of eye contact (corrosive).
Special Remarks on Toxicity to Animals	Lethal Dose/Conc 50% Kill: LD50 [Rat] - Route: Inhalation; Dose: 36 mg/m3
Special Remarks on Chronic Effects on Humans	Not available.
Special Remarks on other Toxic Effects on Humans	Acute Potential Health Effects: Skin: Causes severe irritation and possibly burns if it is in contact with wet skin. It may be absorbed through the skin. Harmful if absorbed through skin. Eyes: Causes blurred vision, redness, pain, burns. Can cause permanent eye damage. Inhalation: Harmful if inhaled. Causes nose, throat irritation, coughing, labored breathing/shortness of breath, and possible chemical burns to the upper respiratory tract. May cause lung edema lung damage. It may also affect behavior/central nervous system (convulsions/seizures, disorientation, agitation, hallucinations, dizziness, tremors, incoordination, CNS depression, headache). Ingestion: Harmful if swallowed. Can cause severe irritation and burns of the mouth, throat and stomach. Symptoms can include sore throat and pain, vomiting, diarrhea. It may also affect behavior/central nervous system (convulsions/seizures, disorientation, agitation, hallucinations, dizziness, tremors, incoordination, CNS depression, headache), liver (fatty liver degeneration), and cause anorexia. Chronic Potential Health Effects: Skin: It may cause weight loss and affect the cardiovascular system upon prolonged or repeated skin contact and absorbed through the skin. Ingestion or Inhalation: Prolonged or repeated exposure by ingestion or inhalation may affect behavior/central nervous system/nervous system, and cause weight loss.


Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation	Not available.

Section 13. Disposal Considerations

Waste Disposal	Waste must be disposed of in accordance with federal, state and local environmental control regulations.
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Section 14. Transport Information

DOT Classification	CLASS 4.3: Dangerous when wet material.
Identification	UNNA: 1426 : Sodium borohydride PG: I
Special Provisions for Transport	Not available.
DOT (Pictograms)	

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations	New Jersey: Sodium borohydride TSCA 8(b) inventory: Sodium borohydride	
California Proposition 65 Warnings	California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found. California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.	
Other Regulations	OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances (EINECS No. 241-004-4). Canada: Listed on Canadian Domestic Substance List (DSL). China: Listed on National Inventory. Japan: Listed on National Inventory (ENCS). Korea: Listed on National Inventory (KECI). Philippines: Listed on National Inventory (PICCS). Australia: Listed on AICS.	
Other Classifications	WHMIS (Canada)	CLASS B-6: Reactive and very flammable material. CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).
	DSCL (EEC)	R15- Contact with water liberates extremely flammable gases. R20/21- Harmful by inhalation and in contact with skin. R25- Toxic if swallowed. R34- Causes burns. S7/8- Keep container tightly closed and dry. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37/39- Wear suitable gloves and eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.)

Health Hazard	3
Fire Hazard	3
Reactivity	2
Personal Protection	E

National Fire Protection Association (U.S.A.)

Health  Flammability
 Reactivity
 Specific hazard

WHMIS (Canada) (Pictograms)



DSCL (Europe) (Pictograms)



TDG (Canada) (Pictograms)



ADR (Europe) (Pictograms)



Protective Equipment



Gloves.



Lab coat.



Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.



Splash goggles.

Section 16. Other Information

MSDS Code S3730

References Not available.

Other Special Considerations Not available.

Validated by Sonia Owen on 2/28/2011.

Verified by Sonia Owen.
 Printed 2/28/2011.

CALL (310) 516-8000**Notice to Reader**

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.