Product Name	Sodium borohydride

Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identification:

Product Description: Sodium borohydride

Synonyms: SBH, Sodium tetrahydroborate

CAS-No: 16940-66-2

EC-No.: 241-004-4

Molecular Formula: $NaBH_4$

REACH Registration No: A registration number is not available for this substance as the substance or its uses are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration, or the registration is envisaged for a later registration deadline.

1.2. Relevant identified uses of the substance or mixture and uses advised against:

Recommended Use: Laboratory chemicals, Manufacture of substances

Details of the supplier of the safety data sheet:

- **Company** — **Finar Limited**
  184-186/P, Chacharwadi Vasna,
  Sarkhej-Bavla Highway,
  Ta.: Sanand, Dist.: Ahmedabad-382110, Gujarat, India.
  Web: www.finarchemicals.com
- **E-Mail Address** — safety.finar@aceto.com; info.finar@aceto.com

1.3. Emergency Telephone Number:

- For Emergency contact on: +91 - 2717 - 616 717

Product Name	Sodium borohydride

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture:

Classification according to Regulation (EC) No 1272/2008

Substances and mixtures which in contact with water emit flammable gases (Category 1), H260

Acute toxicity, Oral (Category 3), H301

Skin corrosion (Sub-category 1B), H314

Serious eye damage (Category 1), H318

Reproductive toxicity (Category 1B), H360FD

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2. Label Elements:

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms

Signal word: Danger

Hazard statements

H260 In contact with water releases flammable gases which may ignite spontaneously.

H301 Toxic if swallowed.

H314 Causes severe skin burns and eye damage.

H360 FD May damage fertility. May damage the unborn child.

Precautionary statements

P201	Obtain special instructions before use.
P231 + P232	Handle and store contents under inert gas. Protect from moisture.
P260	Do not breathe dusts or mists.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ Hearing protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P402 + P404	Store in a dry place in a closed container.

Supplemental Hazard Information (EU)

EUH014 Reacts violently with water.

Reduced Labelling (<= 125 ml)

Hazard pictograms

Signal word: Danger

Hazard statements

H301 Toxic if swallowed.

H314 Causes severe skin burns and eye damage.

H360 FD May damage fertility. May damage the unborn child.

Precautionary statements

P260	Do not breathe dusts or mists.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard Information (EU)

EUH014 Reacts violently with water.

2.3. Other Hazards:

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances: Sodium borohydride

3.2. Mixtures:

Component	CAS-No	EC-No.	Weight %
Sodium borohydride	16940-66-2	241-004-4	>95 %

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures:

- **General advice**

  First aiders need to protect themselves. Show this safety data sheet to the doctor in attendance.

- **If inhaled**

  Remove to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

  If not breathing, give artificial respiration.

- **If case of skin contact**

  Wash off immediately with plenty of water for at least 15 minutes.

  Immediate medical attention is required.

- **In case of eye contact**

  Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

  Immediate medical attention is required.

- **If swallowed**

  Do NOT induce vomiting. Call a physician or poison control centre immediately.

4.2. Most important symptoms and effects, both acute and delayed:

Vomiting, Headache, CNS disorders

Risk of corneal clouding.

The following applies to boron compounds in general: resorption is followed by nausea and vomiting, agitation, spasms, CNS disorders, cardiovascular disorders.

Irritation and corrosion, Cough, Shortness of breath

Risk of blindness!

4.3. Indication of any immediate medical attention and special treatment needed:

No data available

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media:

Suitable Extinguishing Media- Sand, Dry Powder Cement

Unsuitable Extinguishing Media- Water, Foam, Carbon dioxide (CO_2)

5.2. Special hazards arising from the substance or mixture:

Borane/boron oxides

Sodium oxides

Combustible.

Caution! in contact with water product releases:

Hydrogen Vapors are heavier than air and may spread along floors.

May not get in touch with: Water

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapours possible in the event of fire.

5.3. Advice for firefighters:

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further Information:

Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

Product Name	Sodium borohydride

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:

Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

6.2. Environmental precautions:

Do not let product enter drains. Risk of explosion.

6.3. Methods and material for containment and cleaning up:

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4. Reference to other sections:

For disposal see Sections 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling:

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Keep workplace dry.

Do not allow product to come into contact with water.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.

Take precautionary measures against static discharge.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection.

Wash hands and face after working with substance.

For precautions see section 2.2.

7.2. Conditions for safe storage, including any incompatibilities:

Storage conditions

Tightly closed. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.

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

Recommended storage temperature see product label.

7.3. Specific end use(s):

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Contains no substances with occupational exposure limit values.

8.2. Exposure Controls:

- **Appropriate Engineering Controls:**

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Personal Protective Equipment:

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye & Face Protection-

Tightly fitting safety goggles

Hand Protection-

Full contact-

Material:	Nitrile rubber
Minimum layer thickness:	0.11 mm
Break through time:	>480 min

Splash contact-

Material:	Nitrile rubber
Minimum layer thickness:	0.11 mm
Break through time:	>480 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 741 Dermatril® L (full contact), KCL 741 Dermatril® (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Body Protection-

Flame retardant antistatic protective clothing.

Respiratory Protection-

required when dusts are generated.

Recommended Filter type: Filter P 3 (acc. to DIN 3181) for solid and liquid particles of toxic and very toxic substances

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental Exposure Controls-

Do not let product enter drains.

Risk of explosion.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties:

- **Appearance:** White
- **Physical State:** Solid
- **Odor:** amine-like
- **Odor Threshold:** No data available
- **pH:** approx. 11 10 g/l aq. solution
- **Melting Point:** >360 °C
- **Vapor Pressure:** < 1 hPa at 25 °C - OECD Test Guideline 104
- **Vapor Density:** 1.3
- **Viscosity Dynamic:** No data available

- **Viscosity Kinematic:** No data available
- **Lower Explosive Limit:** 3.02 vol %
- **Upper Explosive Limit:** No data available
- **Decomposition Temperature:** 400 °C
- **Volatility:** No data available
- **Density:** 1.074
- **Bulk Density:** powder: 400 kg/m^3 / granules: 510 kg/m^3
- **Water/Oil Dist. Co eff.:** No data available
- **Ionicity (in Water):** No data available
- **Boiling Point/Range:** > 400 °Cat ca.1.013 hPa - OECD Test Guideline 103
- **Flash Point:** 69 °C
- **Specific Gravity:** No data available
- **Auto-Ignition Temperature:** 220 °C
- **Water Solubility:** Reacts violently with water

9.2. Other information:

- **Molecular Weight:** 37.83 g/mol
- **Molecular Formula:** $NaBH_4$

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity:

Forms explosive mixtures with air on intense heating.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

Reacts violently with water.

10.2. Chemical stability:

Sensitive to moisture.

Water reactive. Hygroscopic.

10.3. Possibility of hazardous reactions:

Risk of explosion with: Water, Alcohols (generation of hydrogen)

Copper, Nickel, in finely distributed form.

aluminium chloride, metallic salts, phenol, Strong oxidizing agents, polymerisable substances, hydrogen peroxide, Powdered metals, acids

Risk of ignition or formation of inflammable gases or vapours with: carbon/soot

Exothermic reaction with: phosphoric acid, conc. sulfuric acid, Dimethylformamide

10.4. Conditions to avoid:

Incompatible products. Excess heat. Exposure to moist air or water. Exposure to moisture. Temperatures above 60°C.

10.5. Incompatible materials:

Strong oxidizing agents, Aldehydes, Ketones, Acids, Aluminium.

10.6. Hazardous decomposition products:

Oxides of boron, Hydrogen, Thermal decomposition can lead to release of irritating gases and vapors, Sodium oxides

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:

Acute toxicity

LD50 Oral - Rat - female – 56.57 mg/kg

(OECD Test Guideline 425)

Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

LC50 Inhalation - Rat - male - 4 h - > 1.3 mg/l

Remarks: (highest concentration to be prepared) (ECHA)

Symptoms: mucosal irritations,Cough, Shortness of breath, Possible damages:

damage of respiratory tract

LD50 Dermal - Rabbit - male - 4.000 - 8.000 mg/kg

Remarks: (External MSDS)

Skin corrosion/irritation

Skin - Rabbit

(OECD Test Guideline 404)

Remarks: (Test in mixture)

Serious Eye damage/eye irritation

Causes serious eye damage. Risk of corneal clouding.

Respiratory or Skin sensitization

Sensitisation test: - Guinea pig

Result: negative

Remarks: (External MSDS)

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

May damage the unborn child.

May damage fertility.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Additional Information:

Not available

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.

Decomposition of the substance with tissue moisture.

After absorption: CNS disorders

Headache

Other information

The following applies to boron compounds in general: resorption is followed by nausea and vomiting, agitation, spasms, CNS disorders, cardiovascular disorders.

Other dangerous properties cannot be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity:

Toxicity to fish:

LC50 Danio rerio (zebra fish): > 100 mg/l; 96 h (External MSDS)

Toxicity daphnia and other aquatic invertebrates:

No data available

Toxicity to algae:

No data available

Toxicity to bacteria:

EC50 activated sludge: > 100 mg/l OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

No data available

12.2 Persistence and degradability:

The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulate potential:

No data available

12.4 Mobility in soil:

No data available

12.5 Results of PBT and vPvB assessment:

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects:

Forms toxic mixtures in water, dilution measures notwithstanding.

Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods:

Waste material must be disposed of in accordance with the national and local regulations.

Leave chemicals in original containers. No mixing with other waste.

Handle uncleaned containers like the product itself.

SECTION 14: Transport information

	Land transport (ADR/RID)	Air transport (IATA)	Sea transport (IMDG)
14.1 UN number	UN1426		
14.2 Proper shipping name	SODIUM BOROHYDRIDE		
14.3 Class	4.3		
14.4 Packing group	I		
14.5 Environmentally hazardous	-	-	-
14.6 Special precautions for user	Yes Tunnel Restriction Code E	Yes	Yes EmS F-G S-O
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not Relevant			

SECTION 15: Regulatory information

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

National legislation

Storage Class 4.3

15.2 Chemical safety assessment:

For this product a chemical safety assessment was not carried out.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

EUH014 Reacts violently with water.

H260 In contact with water releases flammable gases which may ignite spontaneously.

H301 Toxic if swallowed.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H360F May damage fertility.

H360FD May damage fertility. May damage the unborn child.

Training advice: -

Provide adequate information, instruction and training for operators.

References: Not available

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Disclaimer:

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