

According to Regulation (EC) No 1907/2006

According to Regulation (EC) No 2020/878

Sodium borohydride

Version number: 3.1
Issued: 2024-03-27
Replaces SDS: 2023-01-13



SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name

Sodium borohydride

CAS number

16940-66-2

EC number

241-004-4

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

Relevant identified uses

Research and development. Laboratory Chemicals. Manufacture of substances.

Not suitable for use in

Not suitable for human consumption or veterinary purposes.

1.3. Details of the supplier of the safety data sheet

Supplier

Molekula Group

Address

Molekula Ltd, Lingfield Way, Darlington,
DL1 4XX Darlington
United Kingdom

Telephone

+44 (0) 3302 000 333

Email

info@molekula.com

Web site

www.molekula.com

Contact person

Kevin Banks

Email

+44 (0) 7769276927

1.4. Emergency telephone number

Poison center/Additional emergency number

0344 892 0111 - National Poisons Information Service (Newcastle Centre)

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Classification

Skin corrosion, hazard category 1B

Reproductive toxicity, hazard category 1B

Acute toxicity, oral, hazard category 3

Acute toxicity, inhalation, hazard category 2

Substances and mixtures, which in contact with water, emit flammable gases, hazard category 1

Hazard statements

H260, H301 + H331, H314, H360FD

2.2. Label elements

Labelling according to 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 + H331 Toxic if swallowed or if inhaled.

H314 Causes severe skin burns and eye damage.

H360FD May damage fertility. May damage the unborn child

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Precautionary statements

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe .
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P284 wear respiratory protection.
 P310 Immediately call a POISON CENTER/doctor.
 P320 Specific treatment is urgent (see on this label).
 P321 Specific treatment (see on this label).
 P330 Rinse mouth.
 P363 Wash contaminated clothing before reuse.
 P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
 P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
 P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P308 + P313 IF exposed or concerned: Get medical advice/attention.
 P405 Store locked up.
 P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
 P501 Dispose of contents/container to .

2.3. Other hazards

No data available

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical name	CAS No. EC No. REACH No. Index No.	Concentration	Classification	H-phrases M factor acute M factor chronic	Note
Sodium borohydride	16940-66-2 241-004-4 - -	100%	Water react. 1, Acute Tox. 3 - oral, Acute Tox. 3 - inhalation, Skin Corr. 1B, Repr. 1B	H260, H301 + H331, H314, H360FD - -	-

Molecular weight

37.83

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Substance additional information

For the complete text of H- / EUH-statements mentioned in this section, see section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

IF exposed or concerned: Get medical advice/attention. First aiders/ medical personnel need to protect themselves. Show this Safety Data Sheet (SDS) to medical personnel.

Inhalation

Toxic if inhaled. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. If breathing stops, provide artificial respiration. For breathing difficulties oxygen may be necessary.

Skin contact

In case of skin contact: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Immediately call a POISON CENTER/doctor. The casualty should be transferred to hospital for further treatment.

Eye contact

Remove contact lenses if present. Rinse eyes with water. Continue to rinse for at least 15 minutes and seek medical attention.

Ingestion

IF SWALLOWED: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only if the persons are fully conscious and awake). Administer activated charcoal (20 - 40g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

Information for doctors

No data available.

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

The severity of the symptoms described will vary dependant of the concentration and the length of exposure. See section 11 for more detailed information on health effects and symptoms.

Inhalation

Single exposure may cause the following adverse effects: Difficulty in breathing. Unconsciousness, possibly death.

Skin contact

Single exposure may cause the following adverse effects: Unconsciousness, possibly death.

Eye contact

Single exposure may cause the following adverse effects: Severe irritation. Unconsciousness, possibly death.

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Ingestion

Single exposure may cause the following adverse effects: Severe abdominal pain. May cause severe internal injury. Unconsciousness, possibly death.

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

Treat symptomatically. No special treatment requirement.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

In case of fire: Use dry sand or cement to extinguish.

Unsuitable extinguishing media

Water. Foam. Carbon dioxide (CO₂).

5.2. Special hazards arising from the substance or mixture

Specific hazards: Toxic. Not combustible.

Borane boron oxides

sodium oxides

Avoid contact with: Water.

Ambient fire may liberate hazardous vapours.

5.3. Advice for firefighters

Special protective equipment for fire-fighters

Evacuate area. Avoid breathing gas, fume, vapours or spray. Cool containers exposed to heat with water spray and remove container, if no risk is involved.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid breathing dust/fume/gas/mist/vapours/spray. Provide adequate ventilation. Avoid contact with skin and eyes. Avoid dust formation. For personal protection, see section 8.

6.2. Environmental precautions

Avoid discharge into drains, water courses or onto the ground. Risk of explosion.

6.3. Methods and material for containment and cleaning up

Collect spillage with shovel, broom or the like and reuse, if possible. Dispose of large amounts of spillage/waste according to agreement with local authorities.

6.4. Reference to other sections

For personal protection, see section 8. For waste disposal, see section 13.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Preventive handling precautions

For precautions see section 2.2. Do not handle until all safety precautions have been read and understood. Do not handle broken packages without protective equipment. This product is toxic. Work under hood Keep containers tightly closed. Do not allow contact with water. Immediate first aid is necessary. Wear protective clothing, gloves, eye and face protection. Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid ingestion and inhalation. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Do not reuse empty containers.

General hygiene

Observe good chemical hygiene practices. Remove contaminated clothing immediately and wash skin with soap and water. Remove contaminated clothing and launder thoroughly before re-use. Wash skin thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Store at room temperature. Store in a dry place. Store in a closed container.

Storage class : Toxic storage.

Handle and store contents under inert gas.

Air sensitive. Moisture Sensitive. Heat sensitive.

7.3. Specific end use(s)

No specific usage precautions noted.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

DNEL/DMEL

Product/Substance name (CAS No./EC No.)	Type	Exposure	Value	Population	Effects
Sodium borohydride (16940-66-2/241-004-4)	DNEL	Chronic (long term) Oral	0.17 mg/kg bw/day	Workers	Systemic
Sodium borohydride (16940-66-2/241-004-4)	DNEL	Chronic (long term) Dermal	240 mg/kg bw/day	Workers	Systemic
Sodium borohydride (16940-66-2/241-004-4)	DNEL	Chronic (long term) Inhalation	5.1 mg/m ³	Workers	Systemic

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Product/Substance name (CAS No./EC No.)	Type	Environmental compartment	Value
Sodium borohydride (16940-66-2/241-004-4)	PNEC	Freshwater	1.75 mg/l
Sodium borohydride (16940-66-2/241-004-4)	PNEC	Sediment (freshwater)	2.55 mg/kg sediment dw
Sodium borohydride (16940-66-2/241-004-4)	PNEC	Intermittent releases	1.75 mg/l
Sodium borohydride (16940-66-2/241-004-4)	PNEC	Sewage Treatment Plant	54.77 mg/l
Sodium borohydride (16940-66-2/241-004-4)	PNEC	Soil	4.8 mg/kg soil dry weight
Sodium borohydride (16940-66-2/241-004-4)	PNEC	Marine water	1.75 mg/l
Sodium borohydride (16940-66-2/241-004-4)	PNEC	Sediment (marine water)	0.255 mg/kg sedi- ment dw

8.2. Exposure controls

Personal Protective Equipment Symbols



Eye / face protection

Wear eye protection.

Hand protection

Wear protective gloves. Recommended gloves: Nitrile.

Glove Thickness: 0.11mm

Breakthrough time: 8 hours

Always inspect gloves before use. If signs of wear and tear are noticed then the gloves should be replaced.

No specific hygiene procedures noted, but good personal hygiene practices are always advisable, especially when working with chemicals. Wash contaminated skin thoroughly after handling.

Other skin protection

Wash skin thoroughly after handling.

Respiratory protection

Provide adequate ventilation. If ventilation is insufficient, suitable respiratory protection must be provided.

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Environmental exposure controls

Avoid discharge into drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state

Solid

Colour

White.

Odour

Odourless.

Melting point / freezing point

> 300 °C

Boiling point or initial boiling point and boiling range

> 400 °C

Flammability

No data available

Lower and upper explosion limit

3.02 %

Flash point

No data available

Auto-ignition temperature

> 400 °C

Decomposition temperature

No data available

pH

10.0 - 11.2

Kinematic viscosity

No data available

Solubility

Decomposes in water.

Partition coefficient n-octanol/water

No data available

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Vapour pressure

No data available

Density and/or relative density

1.074 g/cm³

Relative vapour density

No data available

Particle characteristics

No data available

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reacts violently with water.

10.2. Chemical stability

Stable under the prescribed storage conditions.

Air sensitive. Moisture Sensitive. Heat sensitive.

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 oxidising agents.

Polymerisable material.

hydrogen peroxide

Powdered metal.

Acids.

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

Exothermic reaction with:

PHOSPHORIC ACID, LIQUID

sulphuric acid

Dimethylformamide

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10.4. Conditions to avoid

Air sensitive. Moisture Sensitive. Heat sensitive.

10.5. Incompatible materials

Strong oxidising agents. Acids Aldehydes. Ketones. Aluminium.

10.6. Hazardous decomposition products

See section 5.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Product / Substance name CAS / EC no.	Dose descriptor	Value / Dose	Exposure route	Duration of exposure	Test animals
Sodium borohydride 16940-66-2 / 241-004-4	LD50	56.57 mg/kg	Oral	-	Rat
Sodium borohydride 16940-66-2 / 241-004-4	LC50	>1.3 mg/l (dust/mist)	Inhalation.	4 hours	Rat
Sodium borohydride 16940-66-2 / 241-004-4	LD50	>2000 mg/kg	Dermal	-	Rabbit

Skin corrosion/irritation

Product / Substance name CAS / EC no.	Result	Species
Sodium borohydride 16940-66-2 / 241-004-4	Skin Corr. 1C;H314	Rabbit

Serious eye damage/irritation

Product / Substance name CAS / EC no.	Result	Duration of exposure	Species	Other
Sodium borohydride 16940-66-2 / 241-004-4	Causes serious eye damage.	24 hours	Rabbit	Risk of corneal damage.

Respiratory or skin sensitisation

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Product / Substance name CAS / EC no.	Result	Species
Sodium borohydride 16940-66-2 / 241-004-4	Negative.	Guinea Pig

Germ cell mutagenicity

Product / Substance name CAS / EC no.	Result	Exposure route	Metabolic activation / Exposure	Species	Method / Guideline
Sodium borohydride 16940-66-2 / 241-004-4	Negative.	-	with and without metabolic activation	Escherichia coli/Salmonella typhimurium	Ames test
Sodium borohydride 16940-66-2 / 241-004-4	Negative.	-	with and without metabolic activation	Chinese Hamster cells: Ovary	sister chromatid exchange assay
Sodium borohydride 16940-66-2 / 241-004-4	Negative.	-	with and without metabolic activation	Mouse lymphoma cells	In vitro mammalian cell gene mutation test.
Sodium borohydride 16940-66-2 / 241-004-4	Negative.	Oral	-	Mouse	Micronucleus test

Reproductive toxicity

Product / Substance name CAS / EC no.	Result
Sodium borohydride 16940-66-2 / 241-004-4	May damage fertility. May damage the unborn child.

Aspiration hazard

Based on available data, the classification criteria are not met.

11.2. Information on other hazards

No data available

SECTION 12: Ecological information

12.1. Toxicity

Acute fish toxicity

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Product / Substance name CAS / EC no.	Measurement type	Value / Result	Duration of exposure	Species
Sodium borohydride 16940-66-2 / 241-004-4	LC50	5600 mg/l	96 hours	Gambusia affinis
Sodium borohydride 16940-66-2 / 241-004-4	LC50	74 mg/l	96 hours	Limanda limanda

Acute crustacean toxicity

Product / Substance name CAS / EC no.	Measurement type	Value / Result	Duration of exposure	Species
Sodium borohydride 16940-66-2 / 241-004-4	LC50	133 mg/l	48 hours	Daphnia magna

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. Endocrine disrupting properties

This product does not contain any known or suspected endocrine disruptors.

12.7. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal considerations

Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

14.1. UN number

1426

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14.2. UN proper shipping name

ADR / RID / ADN proper shipping name

SODIUM BOROHYDRIDE

IMDG proper shipping name

SODIUM BOROHYDRIDE

IATA proper shipping name

Sodium borohydride

14.3. Transport hazard class(es)

Label

ADR/RID/ADN



4.3

IMDG



4.3

IATA



4.3

ADR / RID Class

4.3

ADR / RID Classification code

W2

IMDG Class

4.3

IATA Class

4.3

ADN Class

4.3

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ADN Class Code

W2

14.4. Packing group

ADR / RID / ADN: I

IMDG: I

IATA: I

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Special precautions for user

Tunnel restriction code: E

Transport category: 1

IMDG EmS

F-G, S-O

14.7. Maritime transport in bulk according to IMO instruments

Not applicable

SECTION 15: Regulatory information

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

EU regulations

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

This material safety data sheet complies with the requirements of Regulation (EU) 2020/878.

National regulations

Directive: 2012/18/EU: H2 ACUTE TOXIC

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

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SECTION 16: Other information

Phrase meaning

Skin Corr. 1B - Skin corrosion, hazard category 1B

Repr. 1B - Reproductive toxicity, hazard category 1B

Acute Tox. 3 - oral - Acute toxicity, oral, hazard category 3

Acute Tox. 2 - inhalation - Acute toxicity, inhalation, hazard category 2

Water react. 1 - Substances and mixtures, which in contact with water, emit flammable gases, hazard category 1

Acute Tox. 3 - inhalation - Acute toxicity, inhalation, hazard category 3

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

H301 + H331 Toxic if swallowed or if inhaled.

H314 Causes severe skin burns and eye damage.

H360FD May damage fertility. May damage the unborn child