

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 12.06.2019

Version 9.3

SECTION 1. Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

| | |
|---------------------------|--|
| Catalogue No. | 806373 |
| Product name | Sodium borohydride fine granular for synthesis |
| REACH Registration Number | 01-2119485016-39-xxxx |
| CAS-No. | 16940-66-2 |

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

| | |
|-----------------|---|
| Identified uses | Chemical for synthesis For additional information on uses please refer to the Merck Chemicals portal (www.merckgroup.com). |
|-----------------|---|

1.3 Details of the supplier of the safety data sheet

| | |
|------------------------|---|
| Company | Merck KGaA * 64271 Darmstadt * Germany * Phone: +49 6151 72-0 |
| Responsible Department | LS-QHC * e-mail: prodsafe@merckgroup.com |

1.4 Emergency telephone number **Please contact the regional company representation in your country.****SECTION 2. Hazards identification****2.1 Classification of the substance or mixture**
Classification (REGULATION (EC) No 1272/2008)

Substances, which in contact with water, emit flammable gases, Category 1, H260
Acute toxicity, Category 3, Oral, H301
Skin corrosion, Category 1B, H314
Reproductive toxicity, Category 1B, H360FD
For the full text of the H-Statements mentioned in this Section, see Section 16.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No.
Product name

806373
Sodium borohydride fine granular for synthesis

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word
Danger

Hazard statements

H360FD May damage fertility. May damage the unborn child.
H260 In contact with water releases flammable gases which may ignite spontaneously.
H301 Toxic if swallowed.
H314 Causes severe skin burns and eye damage.
EUH014 Reacts violently with water.

Precautionary statements

Prevention

P201 Obtain special instructions before use.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
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 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/
physician.

Storage

P402 + P404 Store in a dry place. Store in a closed container.

Restricted to professional users.

Reduced labelling (≤ 125 ml)

Hazard pictograms



Signal word
Danger

Hazard statements

H360FD May damage fertility. May damage the unborn child.
H301 Toxic if swallowed.
H314 Causes severe skin burns and eye damage.
EUH014 Reacts violently with water.

Precautionary statements

P201 Obtain special instructions before use.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
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lenses, if present and easy to do. Continue rinsing.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

Contains: sodium borohydride
CAS-No. 16940-66-2

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

| | | |
|------------|-------------------|---------------------------|
| Formula | NaBH ₄ | H ₄ BNa (Hill) |
| EC-No. | 241-004-4 | |
| Molar mass | 37,83 g/mol | |

Hazardous components (REGULATION (EC) No 1272/2008)

Chemical name (Concentration)

| CAS-No. | Registration number | Classification |
|------------|-----------------------|--|
| 16940-66-2 | 01-2119485016-39-xxxx | Substances, which in contact with water, emit flammable gases, Category 1, H260 Acute toxicity, Category 3, H301 Skin corrosion, Category 1B, H314 Reproductive toxicity, Category 1B, H360FD |

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

3.2 Mixture

Not applicable

SECTION 4. First aid measures

4.1 Description of first aid measures

General advice

First aider needs to protect himself.

After inhalation: fresh air. Call in physician.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

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 in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

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 information available.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Dry powder, Sand, Cement

Unsuitable extinguishing media

Water, Foam, Carbon dioxide (CO₂)

5.2 Special hazards arising from the substance or mixture

Combustible.

Vapours are heavier than air and may spread along floors.

Forms explosive mixtures with air on intense heating.

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

May not get in touch with:

Water

Caution! in contact with water product releases:

Hydrogen

5.3 Advice for firefighters

Special protective equipment 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.

Further information

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

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.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

Advice for emergency responders:

Protective equipment see section 8.

6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

6.3 Methods and materials 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

Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Observe label precautions.

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.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Dry.

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

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

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

Derived No Effect Level (DNEL)

Worker DNEL, longterm Local effects inhalation 1,7 mg/m³

Predicted No Effect Concentration (PNEC)

| | |
|-----------------------------|------------|
| PNEC Soil | 4,8 mg/kg |
| PNEC Sewage treatment plant | 54,77 mg/l |
| PNEC Marine sediment | 5,6 mg/kg |
| PNEC Marine water | 1,75 mg/l |
| PNEC Fresh water sediment | 5,6 mg/kg |
| PNEC Fresh water | 1,75 mg/l |

8.2 Exposure controls

Engineering measures

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

See section 7.1.

Individual protection measures

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:

| | |
|---------------------|----------------|
| Glove material: | Nitrile rubber |
| Glove thickness: | 0,11 mm |
| Break through time: | > 480 min |

splash contact:

| | |
|---------------------|----------------|
| Glove material: | Nitrile rubber |
| Glove 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® L (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).

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

Other protective equipment

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 entrepreneur 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

| | |
|-----------------------------|---|
| Form | solid |
| Colour | white |
| Odour | amine-like |
| Odour Threshold | No information available. |
| pH | No information available. |
| Melting point | > 360 °C at ca.1.013 hPa Method: OECD Test Guideline 102 |
| Boiling point/boiling range | > 400 °C at ca. 1.013 hPa Method: OECD Test Guideline 103 |
| Flash point | 69 °C at 1.013 hPa Method: closed cup |
| Evaporation rate | No information available. |
| Flammability (solid, gas) | No information available. |
| Lower explosion limit | No information available. |
| Upper explosion limit | No information available. |

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

| | |
|--|---|
| Vapour pressure | < 1 hPa at 25 °C Method: OECD Test Guideline 104 |
| Relative vapour density | 1,3 |
| Density | 1,07 g/cm ³ at 20 °C |
| Relative density | No information available. |
| Water solubility | Decomposes in contact with water., Risk of violent reaction. |
| Partition coefficient: n-octanol/water | Not applicable for inorganic substances |
| Auto-ignition temperature | > 400 °C at 1.013 hPa Method: Relative self-ignition temperature for solids |
| Decomposition temperature | No information available. |
| Viscosity, dynamic | Not applicable |
| Explosive properties | Not classified as explosive. |
| Oxidizing properties | none |
| 9.2 Other data | |
| Ignition temperature | ca. 220 °C |
| Bulk density | ca.350 - 500 kg/m ³ |

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.

10.2 Chemical stability

sensitive to moisture

10.3 Possibility of hazardous reactions

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

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

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

Strong heating.
Moisture.

10.5 Incompatible materials

no information available

10.6 Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity

LD50 Rat: 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 oesophagus and the stomach.

Acute inhalation toxicity

LC50 Rat: > 1,3 mg/l; 4 h ; dust/mist
(highest concentration to be prepared) (ECHA)

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract

Acute dermal toxicity

LD50 Rabbit: 4.000 - 8.000 mg/kg
(External MSDS)

Skin irritation

Causes burns.

Eye irritation

Causes serious eye damage. Risk of corneal clouding.

Risk of blindness!

Sensitisation

Sensitisation test: Guinea pig

Result: negative

(External MSDS)

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

Germ cell mutagenicity

This information is not available.

Carcinogenicity

This information is not available.

Reproductive toxicity

This information is not available.

Teratogenicity

This information is not available.

CMR effects

Teratogenicity:

May damage the unborn child.

Reproductive toxicity:

May damage fertility.

Specific target organ toxicity - single exposure

This information is not available.

Specific target organ toxicity - repeated exposure

This information is not available.

Aspiration hazard

This information is not available.

11.2 Further information

Decomposition of the substance with tissue moisture.

After absorption:

CNS disorders, Headache

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

Other dangerous properties can not 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 to bacteria

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

12.2 Persistence and degradability

Biodegradability

The methods for determining the biological degradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water

Not applicable for inorganic substances

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Other adverse effects

Additional ecological information

Forms toxic mixtures in water, dilution measures notwithstanding.

Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14. Transport information

Land transport (ADR/RID)

| | |
|--|--------------------|
| 14.1 UN number | UN 1426 |
| 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 |

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

| | |
|--|------------------------------------|
| 14.1 UN number | UN 1426 |
| 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 |
| IATA (Passenger) | Not permitted for transport |

Sea transport (IMDG)

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
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14.1 UN number UN 1426
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
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

EU regulations

Major Accident Hazard Legislation SEVESO III
ACUTE TOXIC
H2
Quantity 1: 50 t
Quantity 2: 200 t

SEVESO III
OTHER HAZARDS
O1
Quantity 1: 100 t
Quantity 2: 500 t

SEVESO III
OTHER HAZARDS
O2
Quantity 1: 100 t
Quantity 2: 500 t

Occupational restrictions Take note of Dir 94/33/EC on the protection of young people at work. Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer not regulated

Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC not regulated

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

Substances of very high concern (SVHC) This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of $\geq 0.1\%$ (w/w).

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.

H260 In contact with water releases flammable gases which may ignite spontaneously.
H301 Toxic if swallowed.
H314 Causes severe skin burns and eye damage.
H360FD May damage fertility. May damage the unborn child.

Training advice

Provide adequate information, instruction and training for operators.

Labelling

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 May damage fertility or the unborn child.
EUH014 Reacts violently with water.

Precautionary statements

Prevention
P201 Obtain special instructions before use.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Catalogue No. 806373
Product name Sodium borohydride fine granular for synthesis

Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/physician.

Storage

P402 + P404 Store in a dry place. Store in a closed container.

Further information

Restricted to professional users.

Contains: sodium borohydride

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Regional representation

This information is given on the authorised Safety Data Sheet for your country.

The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

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