

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Sodium borohydride $\geq 97\%$ , extra pure

article number: **4051**

Version: **GHS 4.0 en**

Replaces version of: 2022-02-07

Version: (GHS 3)

date of compilation: 2017-02-09

Revision: 2024-03-02

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

### 1.1 Product identifier

Identification of the substance **Sodium borohydride  $\geq 97\%$ , extra pure**

Article number 4051

CAS number 16940-66-2

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

Relevant identified uses: Laboratory chemical  
Laboratory and analytical use

Uses advised against: Do not use for products which come into direct contact with the skin. Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household). Food, drink and animal feedingstuffs.

### 1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co. KG  
Schoemperlenstr. 3-5  
D-76185 Karlsruhe  
Germany

**Telephone:** +49 (0) 721 - 56 06 0

**Telefax:** +49 (0) 721 - 56 06 149

**e-mail:** [sicherheit@carlroth.de](mailto:sicherheit@carlroth.de)

**Website:** [www.carlroth.de](http://www.carlroth.de)

Competent person responsible for the safety data sheet: Department Health, Safety and Environment

**e-mail (competent person):** [sicherheit@carlroth.de](mailto:sicherheit@carlroth.de)

### 1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 Westmead, NSW	131126	

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
2.12	Substance and mixture which, in contact with water, emits flammable gas	1	Water-react. 1	H260
3.10	Acute toxicity (oral)	3	Acute Tox. 3	H301
3.2	Skin corrosion/irritation	1C	Skin Corr. 1C	H314

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Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.7	Reproductive toxicity	1B	Repr. 1B	H360FD

### Supplemental hazard information

Code	Supplemental hazard information
AUH014	reacts violently with water

For full text of abbreviations: see SECTION 16

### The most important adverse physicochemical, human health and environmental effects

Skin corrosion produces an irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis. In contact with water releases flammable gases which may ignite spontaneously.

## 2.2 Label elements

### Labelling

#### Signal word

**Danger**

#### Pictograms

GHS02, GHS05,  
GHS06, GHS08



#### 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
H360FD	May damage fertility. May damage the unborn child

#### Precautionary statements

##### Precautionary statements - prevention

P231+P232	Handle and store contents under inert gas. Protect from moisture
P260	Do not breathe dusts or mists
P280	Wear eye protection/face protection

##### Precautionary statements - response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P302+P335+P334	IF ON SKIN: Brush off loose particles from skin. Immerse in cool water or wrap in wet bandages
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P370+P378	In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction

For professional users only

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## Supplemental hazard information

AUH014 Reacts violently with water.

### 2.3 Other hazards

This material is combustible, but will not ignite readily.

### Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

### Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of ≥ 0,1%.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Name of substance	Sodium borohydride
Molecular formula	NaBH <sub>4</sub>
Molar mass	37.83 g/mol
CAS No	16940-66-2

## SECTION 4: First aid measures

### 4.1 Description of first aid measures



#### General notes

Take off immediately all contaminated clothing. Self-protection of the first aider.

#### Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

#### Following skin contact

After contact with skin, wash immediately with plenty of water. Immediate medical treatment required because corrosive injuries that are not treated are hard to cure.

#### Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist. Protect uninjured eye.

#### Following ingestion

Rinse mouth immediately and drink plenty of water. If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects). In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

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

Corrosion, Risk of blindness, Gastric perforation, Risk of serious damage to eyes

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

none

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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media



#### **Suitable extinguishing media**

co-ordinate firefighting measures to the fire surroundings!  
dry extinguishing powder, D-powder, dry sand

#### **Unsuitable extinguishing media**

water

### 5.2 Special hazards arising from the substance or mixture

Product may release hydrogen gas. Increased storage temperatures will accelerate this process. Water-reactive (in contact with water releases flammable gases).

### 5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus. Wear full chemical protective clothing.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures



#### **For non-emergency personnel**

Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe dust.

### 6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

### 6.3 Methods and material for containment and cleaning up

#### **Advice on how to contain a spill**

Covering of drains. Take up mechanically.

#### **Advice on how to clean up a spill**

Take up mechanically. Control of dust. Take up carefully when dry.

#### **Other information relating to spills and releases**

Place in appropriate containers for disposal.

### 6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

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## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Provision of sufficient ventilation. Handle and open container with care. Avoid exposure. Avoid dust formation. Clear contaminated areas thoroughly.

**Measures to prevent fire as well as aerosol and dust generation**



Keep away from sources of ignition - No smoking.

**Advice on general occupational hygiene**

When using do not eat or drink. Thorough skin-cleansing after handling the product. When using do not smoke.

### 7.2 Conditions for safe storage, including any incompatibilities

Store in a dry place. Keep container tightly closed. Hygroscopic solid.

**Incompatible substances or mixtures**

Observe hints for combined storage. Do not allow contact with water.

**Evaporative conditions**

Keep container tightly closed and in a well-ventilated place.

**Protect against external exposure, such as**

humidity

**Consideration of other advice:**

Store locked up.

**Specific designs for storage rooms or vessels**

Recommended storage temperature: 15 – 25 °C

### 7.3 Specific end use(s)

No information available.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

**National limit values**

**Occupational exposure limit values (Workplace Exposure Limits)**

This information is not available.

**Environmental values**

Relevant PNECs and other threshold levels				
End-point	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	1.75 mg/l	aquatic organisms	freshwater	short-term (single instance)
PNEC	1.75 mg/l	aquatic organisms	marine water	short-term (single instance)
PNEC	54.77 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)

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Relevant PNECs and other threshold levels				
End-point	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	2.55 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
PNEC	0.255 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
PNEC	4.8 mg/kg	terrestrial organisms	soil	short-term (single instance)

## 8.2 Exposure controls

### Individual protection measures (personal protective equipment)

#### Eye/face protection



Use safety goggle with side protection. Wear face protection.

#### Skin protection



##### • hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

##### • type of material

NBR (Nitrile rubber)

##### • material thickness

>0,11 mm

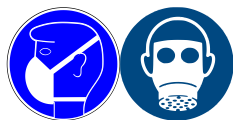
##### • breakthrough times of the glove material

>480 minutes (permeation: level 6)

##### • other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

#### Respiratory protection



Respiratory protection necessary at: Dust formation. Particulate filter device (EN 143). P3 (filters at least 99,95 % of airborne particles, colour code: White).

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### Environmental exposure controls

Keep away from drains, surface and ground water.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Physical state	solid
Form	crystals
Colour	white
Odour	odourless
Melting point/freezing point	>360 °C (ECHA)
Boiling point or initial boiling point and boiling range	>400 °C at 102.7 kPa (ECHA)
Flammability	substance which, in contact with water, emits flammable gases (in accordance with GHS criteria)
Lower and upper explosion limit	not determined
Flash point	69 °C
Auto-ignition temperature	>400 °C at 101.3 kPa (ECHA)
Decomposition temperature	>360 °C
pH (value)	not applicable
Kinematic viscosity	not relevant

#### Solubility(ies)

Water solubility	(spontaneous decomposition)
Solubility in dimethylformamide	180 g/l at 20 °C

#### Partition coefficient

Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
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Vapour pressure	<0 Pa at 25 °C
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#### Density and/or relative density

Density	1.07 g/cm <sup>3</sup> at 20 °C
Relative vapour density	Information on this property is not available.
Bulk density	350 – 500 kg/m <sup>3</sup>

Particle characteristics	No data available.
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#### Other safety parameters

Oxidising properties	none
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### 9.2 Other information

Information with regard to physical hazard classes:

There is no additional information.

Other safety characteristics:

There is no additional information.

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

It's a reactive substance. Reactivity with water.

### 10.2 Chemical stability

Moisture-sensitive. Hygroscopic solid.

### 10.3 Possibility of hazardous reactions

Material reacts vigorously with water emitting flammable gases,

**Violent reaction with:** strong oxidiser, Alcohols, Metal powder, Phenol, Acids, Sulphuric acid, Hydrogen peroxide,  
=> Explosive properties

### 10.4 Conditions to avoid

Keep away from heat. Decomposition takes place from temperatures above:  $>360\text{ }^{\circ}\text{C}$ . Protect from moisture.

### 10.5 Incompatible materials

There is no additional information.

#### Release of flammable materials with

Water

### 10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Classification acc. to GHS

#### Acute toxicity

Toxic if swallowed.

GHS of the United Nations, annex 4. May be harmful in contact with skin.

Acute toxicity					
Exposure route	Endpoint	Value	Species	Method	Source
oral	LD50	56.57 mg/kg	rat		ECHA
dermal	LD50	$\geq 4,000 - \leq 8,000$ mg/kg	rabbit		ECHA

#### Skin corrosion/irritation

Causes severe skin burns and eye damage.

#### Serious eye damage/eye irritation

Causes serious eye damage.

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### Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

### Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

### Carcinogenicity

Shall not be classified as carcinogenic.

### Reproductive toxicity

May damage the unborn child. May damage fertility.

### Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

### Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

### Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

### Symptoms related to the physical, chemical and toxicological characteristics

#### • If swallowed

If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects)

#### • If in eyes

causes burns, Causes serious eye damage, risk of blindness

#### • If inhaled

cough, irritant effects, Dyspnoea

#### • If on skin

causes severe burns, causes poorly healing wounds

#### • Other information

Other adverse effects: Cardiovascular system, Cardiac arrhythmias

## 11.2 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

## SECTION 12: Ecological information

### 12.1 Toxicity

Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)				
Endpoint	Value	Species	Source	Exposure time
LC50	74 mg/l	fish	ECHA	96 h

### 12.2 Persistence and degradability

Data are not available.

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### 12.3 Bioaccumulative potential

Data are not available.

### 12.4 Mobility in soil

Data are not available.

### 12.5 Results of PBT and vPvB assessment

Data are not available.

### 12.6 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

### 12.7 Other adverse effects

Data are not available.

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods



This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

#### Sewage disposal-relevant information

Do not empty into drains.

#### Waste treatment of containers/packages

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used. Handle contaminated packages in the same way as the substance itself. Completely emptied packages can be recycled.

#### Relevant provisions relating to waste (Basel Convention)

#### Properties of waste which render it hazardous

**H4.3** Substances or wastes which, in contact with water emit flammable gases

### 13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions. Non-contaminated packages may be recycled.

## SECTION 14: Transport information

### 14.1 UN number

<b>UN RTDG</b>	UN 1426
IMDG-Code	UN 1426
ICAO-TI	UN 1426

### 14.2 UN proper shipping name

<b>UN RTDG</b>	SODIUM BOROHYDRIDE
IMDG-Code	SODIUM BOROHYDRIDE
ICAO-TI	Sodium borohydride

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### 14.3 Transport hazard class(es)

UN RTDG	4.3
IMDG-Code	4.3
ICAO-TI	4.3

### 14.4 Packing group

UN RTDG	I
IMDG-Code	I
ICAO-TI	I

### 14.5 Environmental hazards

non-environmentally hazardous acc. to the dangerous goods regulations

### 14.6 Special precautions for user

There is no additional information.

### 14.7 Transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

### 14.8 Information for each of the UN Model Regulations

Transport informationNational regulationsAdditional information(UN RTDG)

UN number	1426
Class	4.3
Packing group	I
Danger label(s)	4.3



Special provisions (SP)	- UN RTDG
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Excepted quantities (EQ)	E0 UN RTDG
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Limited quantities (LQ)	0 UN RTDG
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Emergency Action Code	4W
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#### International Maritime Dangerous Goods Code (IMDG) - Additional information

Proper shipping name	SODIUM BOROHYDRIDE
Particulars in the shipper's declaration	UN1426, SODIUM BOROHYDRIDE, 4.3, I
Marine pollutant	-
Danger label(s)	4.3



Special provisions (SP)	-
Excepted quantities (EQ)	E0

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Limited quantities (LQ)	0
EmS	F-G, S-O
Stowage category	E

### International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Proper shipping name	Sodium borohydride
Particulars in the shipper's declaration	UN1426, Sodium borohydride, 4.3, I
Danger label(s)	4.3



## SECTION 15: Regulatory information

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

There is no additional information.

#### National regulations(Australia)

##### Australian Inventory of Chemical Substances(AICS)

Substance is listed.

#### Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

#### National inventories

Country	Inventory	Status
AU	AIIC	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed (ACTIVE)
VN	NCI	substance is listed

#### Legend

AIIC Australian Inventory of Industrial Chemicals

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### Legend

CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSCI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NCI	National Chemical Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

## 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

## SECTION 16: Other information

### Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.1		Supplemental hazard information: change in the listing (table)	yes
2.2		Hazard statements: change in the listing (table)	yes
2.2		Supplemental hazard information	yes
2.2		Supplemental hazard information: change in the listing (table)	yes
2.3		Endocrine disrupting properties: Does not contain an endocrine disruptor (ED) at a concentration of $\geq 0,1\%$ .	yes
14.8		Emergency Action Code: 4W	yes
15.1		National inventories: change in the listing (table)	yes

### Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
DGR	Dangerous Goods Regulations (see IATA/DGR)
ED	Endocrine disruptor
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)

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Abbr.	Descriptions of used abbreviations
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
UN RTDG	UN Recommendations on the Transport of Dangerous Good
vPvB	Very Persistent and very Bioaccumulative

### Key literature references and sources for data

Safe Work Australia's Code of Practice for Labelling of Workplace Hazardous Chemicals (under WHS Regulations).

UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

### List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
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.
H360FD	May damage fertility. May damage the unborn child.

### Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.