

SAFETY DATA SHEET

Australian statement of hazardous nature: Classified as hazardous according to criteria of Safe Work Australia

Section 1 - Identification

Product Name Sodium borohydride

CAS No 16940-66-2

Synonyms SBH; Sodium tetrahydroborate

Product Code A18454

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Recommended Use Laboratory chemicals.

Uses advised against

This product contains one or more substance(s) on the Illicit Drug Precursors/Reagents list.

Verify requirements related to using, handling and storing these substances. This product does not contain any substance(s) subject to Prohibition, Authorization or Restriction. This product does not contain any substance(s) listed on the voluntary National Code of Practice

for Chemicals of Security Concern.

Section 2 - Hazard(s) Identification

Classification under Safe Work Australia

Classified as hazardous according to criteria of Safe Work Australia

Physical hazards

Substances/mixtures which, in contact with water, emit flammable gases Category 1

Health hazards

Acute Oral ToxicityCategory 3Skin Corrosion/IrritationCategory 1 CSerious Eye Damage/Eye IrritationCategory 1Reproductive ToxicityCategory 1B

Environmental hazards

No hazards identified

Label Elements

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Skull and Crossbones

Health Hazard

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

AUH014 - Reacts violently with water

Precautionary Statements

P201 - Obtain special instructions before use

P202 - Do not handle until all safety precautions have been read and understood

P223 - Do not allow contact with water

P231 + P232 - Handle and store contents under inert gas. Protect from moisture

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P264 - Wash face, hands and any exposed skin 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

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or 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

P310 - Immediately call a POISON CENTER or doctor

P330 - Rinse mouth

P331 - Do NOT induce vomiting

P363 - Wash contaminated clothing before reuse

P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish

P302 + P335 + P334 - IF ON SKIN: Brush off loose particles from skin. Immerse in cool water

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

P405 - Store locked up

P501 - Dispose of contents/ container to an approved waste disposal plant

Other information

Toxic to terrestrial vertebrates

Section 3 - Composition and Information on Ingredients

| | Component | CAS No | Weight % | | |
|---|--------------------|------------|----------|--|--|
| Ī | Sodium borohydride | 16940-66-2 | >95 | | |

Section 4 - First Aid Measures

Inhalation

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

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not breathing, give artificial respiration.

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

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Immediate medical

attention is required.

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

Immediate medical attention is required.

General Advice Immediate medical attention is required. Show this safety data sheet to the doctor in

attendance.

Self-Protection of the First Aider Ensure that medical personnel are aware of the material(s) involved, take precautions to

protect themselves and prevent spread of contamination.

First Aid Facilities Eyewash, safety shower and washroom.

Most important symptoms and

effects

Causes burns by all exposure routes. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric

lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should

be investigated

Notes to Physician Treat symptomatically.

Section 5 - Fire Fighting Measures

Suitable Extinguishing Media

CO₂, dry chemical, dry sand, alcohol-resistant foam.

Extinguishing media which must not be used for safety reasons

Water.

Hazardous Decomposition Products

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

Decomposition Temperature

400 °C

Specific Hazards Arising from the Chemical

Corrosive material. Reacts violently with water. Contact with water liberates extremely flammable gases. Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Special protective equipment and precautions for fire fighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6 - Accidental Release Measures

Emergency procedures

Use personal protective equipment as required. Evacuate personnel to safe areas. Ensure adequate ventilation. Avoid dust formation. Do not get in eyes, on skin, or on clothing.

Environmental Precautions

Avoid release to the environment. See Section 12 for additional Ecological Information.

Methods for Containment and Clean Up

Clean-up methods - small spillage

Do not expose spill to water. Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

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Clean-up methods - large spillage

Typically only supplied is small quantiites as packaged goods.

If extremely toxic or used in larger quantities ensure a spillage action plan is in place. Evacuate area. Control the source and/or contain the spill if safe and able to do so. Use temporary diking, sand bags, dry sand, earth or proprietary booms/absorbent pads if available. Obtain advice on containment, neutralisation and clean-up from local emergency responders.

Reference to Other Sections

Refer to protective measures listed in Sections 8 and 13.

Section 7 - Handling and Storage

Precautions for Safe Handling

Use only under a chemical fume hood. Wear personal protective equipment/face protection. Avoid dust formation. Do not get in eyes, on skin, or on clothing. Do not ingest. If swallowed then seek immediate medical assistance. Do not breathe (dust, vapor, mist, gas). Do not allow contact with water.

Conditions for Safe Storage, Including any Incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area. Keep away from water or moist air. Do not store in aluminum containers.

AS/NZS 2243.10:2004, Safety in laboratories - Storage of chemicals

Section 8 - Exposure Controls and Personal Protection

Exposure limits

The product does not contain any hazardous materials with occupational exposure limits established.

Biological limit values

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

Exposure Controls

Engineering Measures

Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection Goggles (Australian/New Zealand Standard AS/NZS 1337 - Eye protectors for Industrial

applications)

Hand Protection Protective gloves

| Glove material Natural rubber Nitrile rubber Neoprene | Breakthrough time See manufacturers recommendations | Glove thickness | AUS/NZ Standard AS/NZS 2161 | Glove comments (minimum requirement) |
|--|---|-----------------|--------------------------------|---|
| PVC | | | | |

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

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Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure

Repiratory ProtectionUse an AS/NZS 1716 approved respirator if exposure limits are exceeded or if irritation or

other symptoms are experienced. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained in line with AS/NZS 1715 on the use

and maintenance of repiratory protective devices

Recommended Filter type: Particulates filter conforming to EN 143 (or AUS/NZ equivalent)

Recommended half mask:- Particle filtering: EN149:2001 (or AUS/NZ equivalent)

When RPE is used a face piece Fit Test should be conducted

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls No information available.

Section 9 - Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance White

Physical State Solid Powder

Odor Odorless

Odor Threshold No data available

pH approx 11 10 g/l aq.solution

Melting Point/Range 360 °C / 680 °F Softening Point No data available

Boiling Point/Range No information available

Flash Point No information available Method - No information available

Evaporation Rate Not applicable Solid

Flammability (solid,gas) No information available Explosion Limits No data available

Vapor Pressure negligible

Vapor DensityNot applicableSolid

Specific Gravity / Density 1.074

Bulk Densitypowder: 400 kg/m³granules: 510 kg/m³Water SolubilityReacts violently with water

Solubility in other solvents

No information available

Partition Coefficient (n-octanol/water)

Autoignition Temperature 220 °C / 428 °F

Decomposition Temperature 400 °C

Viscosity Not applicable Solid

Explosive PropertiesNo information available

Oxidizing Properties Not oxidising

Other information

Molecular Formula H4 B Na Molecular Weight 37.83

Section 10 - Stability and Reactivity

Reactivity Yes

Stability Water reactive. Hygroscopic.

Conditions to Avoid Incompatible products, Excess heat, Exposure to moist air or water, Exposure to moisture,

Temperatures above 60°C.

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

Hazardous Decomposition Products Oxides of boron. Hydrogen. Thermal decomposition can lead to release of irritating gases

and vapors. Sodium oxides.

Hazardous Polymerization Hazardous polymerization does not occur.

Section 11 - Toxicological Information

Information on Toxicological Effects

Product Information

(a) acute toxicity:

Oral Category 3

Dermal Based on available data, the classification criteria are not met Inhalation Based on available data, the classification criteria are not met

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|--------------------|----------------|----------------------|----------------------------|
| Sodium borohydride | 57 mg/kg (Rat) | >2000 mg/kg (Rabbit) | LC50 > 5.18 mg/L (Rat) 1 h |

Category 1 C (b) skin corrosion/irritation;

(c) serious eye damage/irritation; Category 1

(d) respiratory or skin sensitization;

Respiratory Based on available data, the classification criteria are not met Skin

Based on available data, the classification criteria are not met

(e) germ cell mutagenicity; Based on available data, the classification criteria are not met

(f) carcinogenicity; Based on available data, the classification criteria are not met

There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; Category 1B

(h) STOT-single exposure; Based on available data, the classification criteria are not met

(i) STOT-repeated exposure; Based on available data, the classification criteria are not met

None known. **Target Organs**

(i) aspiration hazard; Not applicable

Solid

delayed

Symptoms / effects, both acute and Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is

contraindicated. Possible perforation of stomach or esophagus should be investigated

Section 12 - Ecological Information

Ecotoxicity effects Do not empty into drains. Reacts with water so no ecotoxicity data for the substance is

available.

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Persistence and Degradability

Persistence Degradability

Degradation in sewage treatment plant
Bioaccumulative Potential

Persistence is unlikely, based on information available. Not relevant for inorganic substances, Reacts with water.

Water reactive. Reacts violently with water.

tential Product does not bioaccumulate due to reaction with water

Mobility

Endocrine Disruptor Information Persistent Organic Pollutant Ozone Depletion Potential Reacts with water. Reacts violently with water. Is not likely mobile in the environment

This product does not contain any known or suspected endocrine disruptors

This product does not contain any known or suspected substance This product does not contain any known or suspected substance

Section 13 - Disposal Considerations

Waste from Residues/Unused

Products

Do not allow into drains or watercourses or dispose of where ground or surface waters may be affected. Wastes, including emptied containers, are controlled wastes and should be disposed of in accordance with all federal, E.P.A., state and local regulations. Assure conformity with all applicable regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point. Empty containers

retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and

empty container away from heat and sources of ignition.

Other Information Chemical wastes should be disposed through a licensed commercial waste collection

service. Waste codes should be assigned by the user based on the application for which the product was used. Do not flush to sewer. Can be landfilled or incinerated, when in compliance with local regulations. Do not empty into drains. Large amounts will affect pH

and harm aquatic organisms.

Section 14 - Transport Information

IMDG/IMO

UN-No UN1426

Proper Shipping Name SODIUM BOROHYDRIDE

Hazard Class 4.3 Packing Group

<u>ADG</u>

UN-No UN1426

Proper Shipping Name SODIUM BOROHYDRIDE

Hazard Class 4.3 Packing Group

| Component | Hazchem Code |
|--------------------|--------------|
| Sodium borohydride | 4W |
| 16940-66-2 (>95) | |

IATA

UN-No UN1426

Proper Shipping Name SODIUM BOROHYDRIDE

Hazard Class 4.3 Packing Group

Environmental hazards No hazards identified

Special PrecautionsNo special precautions required

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Additional information

None known

Section 15 - Regulatory Information

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

National Regulations

Australia

See section 8 for national exposure control parameters.

Standard for the Uniform Scheduling of Medicines and Poisons

No poison schedule number allocated.

Australian Industrial Chemicals Introduction Scheme (AICIS)

| Component | Australian Industrial Chemicals Introduction Scheme (AICIS) | Additional information |
|---------------------------------|---|------------------------|
| Sodium borohydride - 16940-66-2 | Present | - |

Australian - Illicit Drug Precursors/Reagents Substance List

This product contains one or more substance(s) on the Illicit Drug Precursors/Reagents list. Verify requirements related to using, handling and storing these substances.

Chemicals of Security Concern

This product does not contain any substance(s) listed on the voluntary National Code of Practice for Chemicals of Security Concern

| | Component | Australian - Illicit Drug | Chemicals of Security Concern |
|---|---------------------------------|------------------------------------|-------------------------------|
| | | Precursors/Reagents Substance List | |
| I | Sodium borohydride - 16940-66-2 | Category 2 | |

Legend

Category 2 - Chemicals and apparatus that require an End User Declaration when sold to non-account customers

National pollutant inventory N

Not applicable

Prohibition or notification/licensing requirements

Shown below are details of specific prohibition/notifications or licencing requirements when they apply.

This product does not contain any substance(s) subject to Prohibition, Authorization or Restriction.

International Inventories

| Component | AICS | NZIoC | EINECS | ELINCS | TSCA | DSL | NDSL | PICCS | ENCS | ISHL | IECSC | KECL |
|--------------------|------|-------|-----------|--------|------|-----|------|-------|-------------|------|-------|----------|
| Sodium borohydride | X | X | 241-004-4 | - | X | Х | - | Х | Х | Χ | Х | KE-31365 |

Legend: X - Listed. '-' - Not Listed. KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

International Regulations

Ozone Depletion Potential This product does not contain any known or suspected substance

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Persistent Organic Pollutant This product does not contain any known or suspected substance

Rotterdam Convention (PIC) Not applicable

Basel convention on the control of transboundary movements of hazardous wastes and their dispoal Not applicable.

| Component | CAS No | OECD HPV | Restriction of | Seveso III Directive | Seveso III Directive |
|--------------------|------------|----------|--------------------------|------------------------------|-----------------------|
| - | | | Hazardous (2012/18/EC) - | | (2012/18/EC) - |
| | | | Substances (RoHS) | Qualifying Quantities | Qualifying Quantities |
| | | | | for Major Accident | for Safety Report |
| | | | | Notification | Requirements |
| Sodium borohydride | 16940-66-2 | Listed | Not applicable | Not applicable | Not applicable |

Authorisation/Restrictions according to EU REACH

Not applicable

Section 16 - Other Information

Legend

AICS - Australian Inventory of Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

IECSC - Chinese Inventory of Existing Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TWA - Time Weighted Average

IARC - International Agency for Research on Cancer

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association

MARPOL - International Convention for the Prevention of Pollution from Ships

NZS 5433:2012 - Transport of Dangerous Goods on Land

LD50 - Lethal Dose 50%

EC50 - Effective Concentration 50% WEL - Workplace Exposure Limit DNEL - Derived No Effect Level

POW - Partition coefficient Octanol:Water **vPvB** - very Persistent, very Bioaccumulative

VOC - (Volatile Organic Compound)

NZIoC - New Zealand Inventory of Chemicals

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

ENCS - Japanese Existing and New Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

CAS - Chemical Abstracts Service

ACGIH - American Conference of Governmental Industrial Hygienists Predicted No Effect Concentration (PNEC)

IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code

ADG Australian Code for the Transport of Dangerous Goods by Road and Rail

OECD - Organisation for Economic Co-operation and Development

LC50 - Lethal Concentration 50% ATE - Acute Toxicity Estimate

RPE - Respiratory Protective Equipment NOEC - No Observed Effect Concentration

BCF - Bioconcentration factor

PBT - Persistent, Bioaccumulative, Toxic

Key literature references and sources for data

https://echa.europa.eu/information-on-chemicals

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Revision Date 18-Nov-2022 Revision Summary Not applicable.

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This Safety Data Sheet (SDS) is prepared in accordance to and complies with the requirements of Safe Work Australia - Work Health and Safety Regulations (WHS Regulations).

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet

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