# AKB158.5 - BORON n-PROPOXIDE

## BORON n-PROPOXIDE
Safety Data Sheet AKB158.5
Date of issue: 11/21/2016
Version: 1.0

### SECTION 1: Identification

<table>
<thead>
<tr>
<th>1.1.</th>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>BORON n-PROPOXIDE</td>
</tr>
<tr>
<td>Product code</td>
<td>AKB158.5</td>
</tr>
<tr>
<td>Product form</td>
<td>Substance</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Formula</td>
<td>C9H21BO3</td>
</tr>
<tr>
<td>Synonyms</td>
<td>TRI-n-PROPYL BORATE</td>
</tr>
<tr>
<td></td>
<td>TRI-n-PROPOXYBORANE</td>
</tr>
<tr>
<td></td>
<td>BORIC ACID, TRI-n-PROPYL ESTER</td>
</tr>
<tr>
<td>Chemical family</td>
<td>BORATE ESTER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.2.</th>
<th>Recommended use and restrictions on use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended use</td>
<td>Chemical intermediate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.3.</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>GELEST, INC.</td>
<td>11 East Steel Road</td>
</tr>
<tr>
<td></td>
<td>Morrisville, PA 19067 USA</td>
</tr>
<tr>
<td></td>
<td>T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:info@gelest.com">info@gelest.com</a> - <a href="http://www.gelest.com">www.gelest.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.4.</th>
<th>Emergency telephone number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency number</td>
<td>CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)</td>
</tr>
</tbody>
</table>

### SECTION 2: Hazard(s) Identification

<table>
<thead>
<tr>
<th>2.1.</th>
<th>Classification of the substance or mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHS-US classification</td>
<td></td>
</tr>
<tr>
<td>Flammable liquids Category 3</td>
<td>H226 Flammable liquid and vapor</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation Category 2A</td>
<td>H319 Causes serious eye irritation</td>
</tr>
<tr>
<td>Full text of H statements : see section 16</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.2.</th>
<th>GHS Label elements, including precautionary statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHS US labeling</td>
<td></td>
</tr>
<tr>
<td>Hazard pictograms (GHS US)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signal word (GHS US)</th>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard statements (GHS US)</td>
<td>H226 - Flammable liquid and vapor</td>
</tr>
<tr>
<td></td>
<td>H319 - Causes serious eye irritation</td>
</tr>
<tr>
<td>Precautionary statements (GHS US)</td>
<td>P280 - Wear protective gloves/protective clothing/eye protection/face protection.</td>
</tr>
<tr>
<td></td>
<td>P210 - Keep away from heat, open flames, sparks. - No smoking.</td>
</tr>
<tr>
<td></td>
<td>P233 - Keep container tightly closed.</td>
</tr>
<tr>
<td></td>
<td>P240 - Ground/Bond container and receiving equipment</td>
</tr>
<tr>
<td></td>
<td>P241 - Use explosion-proof electrical equipment</td>
</tr>
<tr>
<td></td>
<td>P242 - Use only non-sparking tools.</td>
</tr>
<tr>
<td></td>
<td>P243 - Take precautionary measures against static discharge.</td>
</tr>
<tr>
<td></td>
<td>P264 - Wash hands thoroughly after handling.</td>
</tr>
<tr>
<td></td>
<td>P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower</td>
</tr>
<tr>
<td></td>
<td>P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing</td>
</tr>
<tr>
<td></td>
<td>P337+P313 - If eye irritation persists: Get medical advice/attention.</td>
</tr>
<tr>
<td></td>
<td>P370+P378 - In case of fire: Use alcohol resistant foam, carbon dioxide, dry chemical to extinguish.</td>
</tr>
<tr>
<td></td>
<td>P403+P235 - Keep in a cool place</td>
</tr>
<tr>
<td></td>
<td>P501 - Dispose of contents/container to licensed waste disposal facility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.3.</th>
<th>Hazards not otherwise classified (HNOC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other hazards not contributing to the classification</td>
<td>Additional n-propanol may be formed by reaction with moisture and water. The US OSHA PEL (TWA) for n-propanol is 200 ppm. The US ACGIH (TWA) for n-propanol is 200 ppm.</td>
</tr>
</tbody>
</table>

Print date: 04/09/2019
EN (English US)
SDS ID: AKB158.5
BORON n-PROPOXIDE
Safety Data Sheet

2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances
Substance type : Mono-constituent
Name : BORON n-PROPOXIDE
CAS-No. : 688-71-1

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boron n-propoxide</td>
<td>(CAS-No.) 688-71-1</td>
<td>95 - 100</td>
<td>Flamm. Liq. 3, H226</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. 2A, H319</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures
Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures
First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.
First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.
First-aid measures after skin contact : Wash with plenty of soap and water. Get medical advice/attention.
First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.
First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2. Most important symptoms and effects (acute and delayed)
Symptoms/effects after inhalation : May cause irritation to the respiratory tract.
Symptoms/effects after skin contact : May cause skin irritation.
Symptoms/effects after eye contact : Causes serious eye irritation.
Symptoms/effects after ingestion : May be harmful if swallowed.

4.3. Immediate medical attention and special treatment, if necessary
No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media
Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide. Dry chemical.
Unsuitable extinguishing media : Avoid water spray as n-propanol will be generated.

5.2. Specific hazards arising from the chemical
Fire hazard : Flammable liquid and vapor. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.
Explosion hazard : May form flammable/explosive vapor-air mixture.

5.3. Special protective equipment and precautions for fire-fighters
Firefighting instructions : Exercise caution when fighting any chemical fire.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
General measures : Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel
Protective equipment : Wear protective equipment as described in Section 8.
Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders
Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection”.

6.2. Environmental precautions
Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.
BORON n-PROPOXIDE
Safety Data Sheet

6.3. Methods and material for containment and cleaning up
For containment
Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for cleaning up
Clean up any spills as soon as possible, using an absorbent material to collect it. Use only non-sparking tools.

6.4. Reference to other sections
See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Additional hazards when processed
Handle empty containers with care because residual vapors are flammable. Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Precautions for safe handling
Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. Provide good ventilation in process area to prevent accumulation of vapors. Take precautionary measures against static discharge. Use only non-sparking tools.
Hygiene measures
Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities
Technical measures
Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.
Storage conditions
Keep container tightly closed. Keep in a cool place.
Incompatible materials
Water.
Storage area
Store in a well-ventilated place. Store away from heat.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No additional information available

8.2. Appropriate engineering controls
Appropriate engineering controls
Provide local exhaust or general room ventilation.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:
Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection:
Neoprene or nitrile rubber gloves

Eye protection:
Chemical goggles. Contact lenses should not be worn

Skin and body protection:
Wear suitable protective clothing

Respiratory protection:
Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified organic vapor (black cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state
Liquid
Appearance
Liquid.
Molecular mass
188.08 g/mol
Color
Water white.
Odor
Slight.
Odor threshold
No data available
Refractive index
No data available
pH
No data available
Relative evaporation rate (butyl acetate=1)
No data available
Melting point
< 0 °C
BORON n-PROPOXIDE
Safety Data Sheet

Freezing point: No data available
Boiling point: 175 °C
Flash point: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Flammability (solid, gas): Flammable liquid and vapor
Vapor pressure: No data available
Relative vapor density at 20 °C: > 1
Relative density: 0.857
Solubility: Reacts with water.
Log Pow: No data available
Log Kow: No data available
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available
Explosive properties: No data available
Oxidizing properties: No data available
Explosion limits: No data available

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
No additional information available

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Material decomposes slowly in contact with air by reaction with moisture, liberating methoxyethanol and boric acid.

10.4. Conditions to avoid
Heat. Open flame. Sparks.

10.5. Incompatible materials
Water.

10.6. Hazardous decomposition products
Boron oxide fumes. Organic acid vapors. n-Propanol.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Not classified
Skin corrosion/irritation: Not classified
Serious eye damage/irritation: Causes serious eye irritation.
Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified

Reproductive toxicity: Not classified
Specific target organ toxicity – single exposure: Not classified

Specific target organ toxicity – repeated exposure: Not classified

Aspiration hazard: Not classified
Symptoms/effects after inhalation: May cause irritation to the respiratory tract.
Symptoms/effects after skin contact: May cause skin irritation.
Symptoms/effects after eye contact: Causes serious eye irritation.
Symptoms/effects after ingestion: May be harmful if swallowed.
Reason for classification: Expert judgment
BORON n-PROPOXIDE
Safety Data Sheet

SECTION 12: Ecological information

12.1. Toxicity
No additional information available

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
Other adverse effects : This substance may be hazardous to the environment.
Effect on the ozone layer : No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods
Sewage disposal recommendations : Do not dispose of waste into sewer.
Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Additional information : Handle empty containers with care because residual vapors are flammable.
Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number
UN-No.(DOT) : 1993
DOT NA no. : UN1993

14.2. UN proper shipping name
Transport document description : UN1993 Flammable liquids, n.o.s. (BORON n-PROPOXIDE), 3, III
Proper Shipping Name (DOT) : Flammable liquids, n.o.s. (BORON n-PROPOXIDE)
Class (DOT) : 3 - Class 3 : Flammable and combustible liquid 49 CFR 173.120
Packing group (DOT) : III - Minor Danger
Hazard labels (DOT) : 3 - Flammable liquid

DOT Packaging Non Bulk (49 CFR 173.xxx) : 203
DOT Packaging Bulk (49 CFR 173.xxx) : 242
DOT Packaging Exceptions (49 CFR 173.xxx) : 150
DOT Symbols : G - Identifies PSN requiring a technical name

14.3. Additional information
Emergency Response Guide (ERG) Number : 128
Other information : No supplementary information available.

Transport by sea
DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

Air transport
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 60 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 220 L

SECTION 15: Regulatory information

15.1. US Federal regulations

Print date: 04/09/2019 EN (English US) SDS ID: AKB158.5 5/6
BORON n-PROPOXIDE
Safety Data Sheet

**Boron n-propoxide (688-71-1)**
Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

**CANADA**

**Boron n-propoxide (688-71-1)**
Listed on the Canadian NDSL (Non-Domestic Substances List)

**EU-Regulations**

**Boron n-propoxide (688-71-1)**
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

**National regulations**

**Boron n-propoxide (688-71-1)**
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Japanese Pollutant Release and Transfer Register Law (PRTR Law)

### 15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

### FULL TEXT OF H-PHRASES:

<table>
<thead>
<tr>
<th>H-phrases</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H226</td>
<td>Flammable liquid and vapor</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
</tbody>
</table>

**Abbreviations and acronyms**

Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor.

**Hazard Rating**

**Health**

2 Moderate Hazard - Temporary or minor injury may occur

**Flammability**

3 Serious Hazard - Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 F and boiling points above 100 F. as well as liquids with flash points between 73 F and 100 F. (Classes IB & IC)

**Physical**

1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

Prepared by safety and environmental affairs.

Date of issue: 11/21/2016
Version: 1.0

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

The information contained in this document has been gathered from reference materials and/or Gelest, Inc. test data and is to the best knowledge and belief of Gelest, Inc. accurate and reliable. Such information is offered solely for your consideration, investigation and verification. It is not suggested or guaranteed that the hazard precautions or procedures described are the only ones which exist. Gelest, Inc. makes no warranties, express or implied, with respect to the use of such information and assumes no responsibility therefore. Information on this safety data sheet is not intended to constitute a basis for product specifications.

© 2019 Gelest Inc. Morrisville, PA 19067