# SECTION 1: Identification

## 1.1. Identification

<table>
<thead>
<tr>
<th><strong>Product name</strong></th>
<th>BORON ISOPROPOXIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product code</strong></td>
<td>AKB156.5</td>
</tr>
<tr>
<td><strong>Product form</strong></td>
<td>Substance</td>
</tr>
<tr>
<td><strong>Physical state</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Formula</strong></td>
<td>C₉H₂₁BO₃</td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>TRIISOPROPYL BORATE</td>
</tr>
<tr>
<td></td>
<td>BORIC ACID, TRIISOPROPYL ESTER</td>
</tr>
<tr>
<td><strong>Chemical family</strong></td>
<td>BORATE ESTER</td>
</tr>
</tbody>
</table>

## 1.2. Recommended use and restrictions on use

**Recommended use**: Chemical intermediate

## 1.3. Supplier

**GELEST, INC.**
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

## 1.4. Emergency telephone number

**Emergency number**: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

# SECTION 2: Hazard(s) Identification

## 2.1. Classification of the substance or mixture

<table>
<thead>
<tr>
<th><strong>GHS-US classification</strong></th>
<th><strong>Full text of H statements</strong>: see section 16</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

## 2.2. GHS Label elements, including precautionary statements

### GHS US labeling

**Signal word (GHS US)** : Warning

**Hazard pictograms (GHS US)** :

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**Hazard statements (GHS US)** :

- H226 - Flammable liquid and vapor
- H319 - Causes serious eye irritation

**Precautionary statements (GHS US)** :

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

## 2.3. Hazards not otherwise classified (HNOC)

**Other hazards not contributing to the classification** :

- Additional isopropanol may be formed by reaction with moisture and water. The US ACGIH (TWA) for isopropanol is 200 ppm. The US OSHA PEL (TWA) for isopropanol is 400 ppm.
BORON ISOPROPOXIDE
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2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances
Name: BORON ISOPROPOXIDE
CAS-No.: 5419-55-6

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boron isopropoxide</td>
<td>(CAS-No.) 5419-55-6</td>
<td>95 - 100</td>
<td>Flam. Liq. 3, H226, 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
Note to physician: Boron isopropoxide hydrolyzes to form isopropanol and boric acid. Treatment for exposure to isopropanol may be considered.
At very high levels borates affect the CNS.

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 isopropanol 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.
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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>188.08 g/mol</td>
</tr>
<tr>
<td>Color</td>
<td>Water white.</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>1.376</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>&lt; 0 °C</td>
</tr>
</tbody>
</table>
BORON ISOPROPOXIDE
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Freezing point : No data available
Boiling point : 139 - 141 °C
Flash point : 28 °C
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : Flammable liquid and vapor
Vapor pressure : 76 mm Hg @ 75°C
Relative vapor density at 20 °C : > 1
Relative density : 0.815
% Volatiles : > 90 %
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 isopropanol 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.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity : Not classified

**Boron isopropoxide (5419-55-6)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>2500 mg/kg</td>
</tr>
<tr>
<td>ATE US (oral)</td>
<td>2500 mg/kg body weight</td>
</tr>
</tbody>
</table>

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

None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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

### 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)**: 2616
- **DOT NA no.**: UN2616

#### 14.2. UN proper shipping name
- **Transport document description**: UN2616 Triisopropyl borate, 3, III
- **Proper Shipping Name (DOT)**: Triisopropyl borate
- **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

#### 14.3. Additional information
- **Emergency Response Guide (ERG) Number**: 129
- **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

| Boron isopropoxide (5419-55-6) | Listed on the United States TSCA (Toxic Substances Control Act) inventory |

#### 15.2. International regulations

**CANADA**

| Boron isopropoxide (5419-55-6) | Listed on the Canadian NDSSL (Non-Domestic Substances List) |

**EU-Regulations**

| Boron isopropoxide (5419-55-6) | Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) |

**National regulations**

- Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
- Listed on NZIoC (New Zealand Inventory of Chemicals)
- Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
- Japanese Pollutant Release and Transfer Register Law (PRTR Law)
- Listed on INSQ (Mexican National Inventory of Chemical Substances)

#### 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

<table>
<thead>
<tr>
<th>Boron isopropoxide (5419-55-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
</tbody>
</table>

### SECTION 16: Other information

**Full text of H-phrases:**

| H226 | Flammable liquid and vapor |
| H319 | Causes serious eye irritation |

**Abbreviations and acronyms**

- 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: 10/05/2016 
Version: 1.0

SDS US (GHS HazCom 2012) - Custom

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