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

1.1. Product identifier

Product form: Substance
Physical state: Liquid
Substance name: BORON TRIFLUORIDE ETHERATE
Product code: INBO060
Formula: C4H10BF3O
Synonyms: BORON TRIFLUORIDE DIETHYL ETHERATE (1:1)
Chemical family: BORON COMPOUND

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

Use of the substance/mixture: Chemical intermediate
For research and industrial use only

1.3. Details of the supplier of the safety data sheet

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: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)
- Flam. Liq. 3 H226
- Acute Tox. 4 (Oral) H302
- Skin Corr. 1A H314
- Eye Dam. 1 H318
- STOT SE 3 H335

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

- Hazard pictograms (GHS-US)
- Signal word (GHS-US): Danger
- Hazard statements (GHS-US)
  - H226 - Flammable liquid and vapor
  - H302 - Harmful if swallowed
  - H314 - Causes severe skin burns and eye damage
  - H318 - Causes serious eye damage
  - H335 - May cause respiratory 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
  - P240 - Ground/bond container and receiving equipment
  - P241 - Use explosion-proof electrical equipment
  - P242 - Use only non-sparking tools
  - P243 - Take precautionary measures against static discharge
  - P260 - Do not breathe vapors
  - P264 - Wash hands thoroughly after handling
  - P270 - Do not eat, drink or smoke when using this product
  - P271 - Use only outdoors or in a well-ventilated area
  - P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting
  - P301+P312 - If swallowed: Call a doctor if you feel unwell
  - P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. Rinse skin with water/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 doctor
P363 - Store in a cool place
P363 - Wash contaminated clothing before reuse
P370+P378 - In case of fire: Use alcohol resistant foam, carbon dioxide, dry chemical to extinguish
P405 - Store locked up
P501 - Dispose of contents/container to licensed waste disposal facility.

2.3. Other hazards
No additional information available

2.4. Unknown acute toxicity (GHS-US)
No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

<table>
<thead>
<tr>
<th>Substance</th>
<th>Substance type</th>
<th>Name</th>
<th>CAS No</th>
<th>EC no</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boron trifluoride etherate</td>
<td>Multi-constituent</td>
<td>BORON TRIFLUORIDE ETHERATE</td>
<td>109-63-7</td>
<td>203-689-8</td>
</tr>
<tr>
<td>Ethyl ether</td>
<td></td>
<td>(CAS No) 60-29-7</td>
<td>&lt; 1</td>
<td></td>
</tr>
<tr>
<td>Hydrogen fluoride</td>
<td></td>
<td>(CAS No) 7664-39-3</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

3.2. Mixture
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.

First-aid measures after skin contact: Wash with plenty of soap and water. Get immediate 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 immediate 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, both acute and delayed

Symptoms/injuries: Causes severe skin burns and eye damage.

Symptoms/injuries after inhalation: May cause respiratory irritation.

Symptoms/injuries after skin contact: Causes (severe) skin burns.

Symptoms/injuries after eye contact: Causes serious eye damage.

Symptoms/injuries after ingestion: Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

4.3. Indication of any immediate medical attention and special treatment needed
No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Alcohol-resistant foam. Carbon dioxide. Dry chemical. Use of high expansion foam (100:1) is recommended to cover flames.

Unsuitable extinguishing media: Water.
5.2. Special hazards arising from the substance or mixture

- **Fire hazard**: Flammable liquid and vapor. Irritating fumes of hydrogen fluoride and organic acid vapors may develop when material is exposed to water or open flame.

5.3. Advice for firefighters

- **Firefighting instructions**: Use only dry media to extinguish flames. Water spray or fog should only be used to knock down hydrogen fluoride vapors in areas downwind from the 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**: Remove ignition sources. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

- **Emergency procedures**: Evacuate unnecessary personnel.

6.1.2. For emergency responders

- **Protective equipment**: Equip cleanup crew with proper 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

- **Methods for cleaning up**: Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. 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

- **Precautions for safe handling**: Avoid all eye and skin contact and do not breathe vapor and mist. Provide good ventilation in process area to prevent accumulation of vapors. Ground/bond container and receiving equipment. Bottles may develop pressure on storage; open slowly. Take precautionary measures against static discharge. Use only non-sparking tools.

- **Hygiene measures**: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

- **Storage conditions**: Keep container tightly closed. Store in sealed corrosion resistant containers.


- **Storage area**: Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)

No additional information available.

**SECTION 8: Exposure controls/personal protection**

8.1. Control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>OSHA PEL (TWA) (ppm)</th>
<th>ACGIH TWA (ppm)</th>
<th>ACGIH STEL (ppm)</th>
<th>US OSHA PEL (TWA) (mg/m³)</th>
<th>US OSHA PEL (TWA) (ppm)</th>
<th>US IDLH (mg/m³)</th>
<th>US IDLH (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boron trifluoride etherate (109-63-7)</td>
<td>1 ppm BF3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethyl ether (60-29-7)</td>
<td></td>
<td>400 ppm</td>
<td></td>
<td>1200 mg/m³</td>
<td></td>
<td>1900 ppm (10% LEL)</td>
<td></td>
</tr>
<tr>
<td>Hydrogen fluoride (7664-39-3)</td>
<td></td>
<td>0.5 ppm</td>
<td></td>
<td>2 ppm</td>
<td></td>
<td>2.5 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>
BORON TRIFLUORIDE ETHERATE
Safety Data Sheet

**Safety Data Sheet**

**SDS ID**: INBO060

**Boron trifluoride etherate (109-63-7)**

<table>
<thead>
<tr>
<th>USA NIOSH</th>
<th>NIOSH REL (ceiling) (ppm)</th>
<th>6 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA OSHA</td>
<td>OSHA PEL (TWA) (ppm)</td>
<td>3 ppm</td>
</tr>
<tr>
<td>USA IDLH</td>
<td>US IDLH (ppm)</td>
<td>30 ppm</td>
</tr>
</tbody>
</table>

**3.2. Exposure controls**

<table>
<thead>
<tr>
<th>Appropriate engineering controls</th>
<th>Provide local exhaust or general room ventilation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal protective equipment</td>
<td>Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.</td>
</tr>
<tr>
<td>Hand protection</td>
<td>Neoprene or nitrile rubber gloves.</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Chemical goggles or face shield. Contact lenses should not be worn.</td>
</tr>
<tr>
<td>Skin and body protection</td>
<td>Wear suitable protective clothing.</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>NIOSH-certified combination organic vapor/acid gas (yellow cartridge) respirator.</td>
</tr>
</tbody>
</table>

**SECTION 9: Physical and chemical properties**

**9.1. Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid.</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>141.94 g/mol</td>
</tr>
<tr>
<td>Color</td>
<td>Straw.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>1.348</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>~ 1</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>-58 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>126 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>48 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>160 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Flammable liquid and vapor</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>4.2 mm Hg @ 20°C</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>4.9</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.12</td>
</tr>
<tr>
<td>VOC content</td>
<td>100 %</td>
</tr>
<tr>
<td>Solubility</td>
<td>Reacts violently with water.</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Kow</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>1.9 - 36 vol % (lower; upper)</td>
</tr>
</tbody>
</table>

**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 in sealed corrosion resistant containers stored under a dry inert atmosphere.

**10.3. Possibility of hazardous reactions**

Reacts with water and moisture in air, liberating boron trifluoride and hydrogen fluoride.

**10.4. Conditions to avoid**

Heat. Open flame. Sparks.
# BORON TRIFLUORIDE ETHERATE
## Safety Data Sheet

---

### 10.5. Incompatible materials

### 10.6. Hazardous decomposition products

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Acute toxicity
Oral: Harmful if swallowed.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Route</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BORON TRIFLUORIDE ETHERATE (109-63-7)</td>
<td>ATE US (oral)</td>
<td>369.072 mg/kg body weight</td>
</tr>
<tr>
<td>Boron trifluoride etherate (109-63-7)</td>
<td>LD50 oral rat</td>
<td>358 mg/kg</td>
</tr>
<tr>
<td></td>
<td>LC50 inhalation rat</td>
<td>1180 mg/m³ (For BF₃ @ 4H)</td>
</tr>
<tr>
<td>Ethyl ether (60-29-7)</td>
<td>ATE US (oral)</td>
<td>358.000 mg/kg body weight</td>
</tr>
<tr>
<td>Hydrogen fluoride (7664-39-3)</td>
<td>LD50 oral rat</td>
<td>1215 mg/kg</td>
</tr>
<tr>
<td></td>
<td>ATE US (oral)</td>
<td>1215.000 mg/kg body weight</td>
</tr>
</tbody>
</table>

#### Skin corrosion/irritation
Causes severe skin burns and eye damage.

#### Specific target organ toxicity (single exposure)
May cause respiratory irritation.

#### Specific target organ toxicity (repeated exposure)
Not classified

#### Respiratory or skin sensitization
Not classified

#### Reproductive toxicity
Not classified

#### Germ cell mutagenicity
Not classified

#### Carcinogenicity
Not classified

#### Aspiration hazard
Not classified

#### Potential Adverse human health effects and symptoms
Animal data indicates that chronic exposure to BF₃ may cause dental fluorosis (mottling of teeth) and hypocalcemia as well as damage to kidneys and lungs.

#### Symptoms/injuries after inhalation
May cause respiratory irritation.

#### Symptoms/injuries after skin contact
Causes (severe) skin burns.

#### Symptoms/injuries after eye contact
Causes serious eye damage.

#### Symptoms/injuries after ingestion
Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

#### Reason for classification
Expert judgment

### 12. Toxicity

#### Ethyl ether (60-29-7)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>2560 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])</td>
</tr>
<tr>
<td>LC50 fish 2</td>
<td>&gt; 10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])</td>
</tr>
</tbody>
</table>

#### Hydrogen fluoride (7664-39-3)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC50 Daphnia 1</td>
<td>270 mg/l (Exposure time: 48 h - Species: Daphnia species)</td>
</tr>
</tbody>
</table>

### 12.1. Persistence and degradability
No additional information available

### 12.2. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl ether (60-29-7)</td>
<td>Log Pow: 0.82 (at 23 °C)</td>
</tr>
<tr>
<td>Hydrogen fluoride (7664-39-3)</td>
<td>BCF fish 1: (no bioaccumulation)</td>
</tr>
<tr>
<td></td>
<td>Log Pow: -1.4</td>
</tr>
</tbody>
</table>

### 12.4. Mobility in soil
No additional information available
BORON TRIFLUORIDE ETHERATE
Safety Data Sheet

12.5. Other adverse effects
Other adverse effects : This substance may be hazardous to the environment.
Effect on ozone layer : No additional information available
Effect on the global warming : No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number
UN-No.(DOT) : 2604
DOT NA no. : UN2604

14.2. UN proper shipping name
Proper Shipping Name (DOT) : Boron trifluoride diethyl etherate
Hazard Classes (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136
Hazard labels (DOT) : 8 - Corrosive
 : 3 - Flammable liquid

Packing group (DOT) : I - Great Danger
DOT Packaging Exceptions (49 CFR 173.xxx) : None
DOT Packaging Non Bulk (49 CFR 173.xxx) : 201
DOT Packaging Bulk (49 CFR 173.xxx) : 243

14.3. Additional information
Other information : No supplementary information available.

Transport by sea
DOT Vessel Stowage Location : D - The material must be stowed “on deck only” on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.
DOT Vessel Stowage Other : 40 - Stow “clear of living quarters”

Air transport
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 0.5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 2.5 L

SECTION 15: Regulatory information

15.1. US Federal regulations
Boron trifluoride etherate (109-63-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ethyl ether (60-29-7)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
EPA TSCA Regulatory Flag : T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.

Hydrogen fluoride (7664-39-3)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on United States SARA Section 302
Listed on United States SARA Section 313
SARA Section 302 Threshold Planning Quantity (TPQ) : 100
SARA Section 313 - Emission Reporting : 1.0 %

15.2. International regulations
Boron trifluoride etherate (109-63-7)
- Listed on the AICS (Australian Inventory of Chemical Substances)
- Listed on the Canadian DSL (Domestic Substances List)
- Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
- Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
- Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
- Listed on the Korean ECL (Existing Chemicals List)
- Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
- Japanese Pollutant Release and Transfer Register Law (PRTR Law)
- Listed on the Canadian IDL (Ingredient Disclosure List)

Ethyl ether (60-29-7)
- Listed on the AICS (Australian Inventory of Chemical Substances)
- Listed on the Canadian DSL (Domestic Substances List)
- Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
- Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
- Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
- Listed on the Korean ECL (Existing Chemicals List)
- Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
- Listed on the Canadian IDL (Ingredient Disclosure List)

Hydrogen fluoride (7664-39-3)
- Listed on the AICS (Australian Inventory of Chemical Substances)
- Listed on the Canadian DSL (Domestic Substances List)
- Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
- Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
- Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
- Listed on the Korean ECL (Existing Chemicals List)
- Listed on the Japanese ISHL (Industrial Safety and Health Law)
- Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
- Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
- Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
- Listed on the Canadian IDL (Ingredient Disclosure List)

15.3. US State regulations

<table>
<thead>
<tr>
<th>Substance</th>
<th>Reporting Category 1</th>
<th>Reporting Category 2</th>
<th>Reporting Category 3</th>
<th>Reporting Category 4</th>
<th>Reporting Category 5</th>
<th>Reporting Category 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - California - Proposition 65 - Carcinogens List</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Developmental Toxicity</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Boron trifluoride etherate (109-63-7)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Reporting Category 1</th>
<th>Reporting Category 2</th>
<th>Reporting Category 3</th>
<th>Reporting Category 4</th>
<th>Reporting Category 5</th>
<th>Reporting Category 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - Massachusetts - Oil &amp; Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - Massachusetts - Oil &amp; Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - Massachusetts - Oil &amp; Hazardous Material List - Reportable Quantity</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - Massachusetts - Oil &amp; Hazardous Material List - Soil Reportable Concentration - Reporting Category 1</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
# BORON TRIFLUORIDE ETHERATE

## Safety Data Sheet

### Boron trifluoride etherate (109-63-7)

**U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2**
**U.S. - Massachusetts - Right To Know List**
**U.S. - New Jersey - Right to Know Hazardous Substance List**
**U.S. - New Jersey - Special Health Hazards Substances List**
**U.S. - Pennsylvania - RTK (Right to Know) List**

### Ethyl ether (60-29-7)

**U.S. - Colorado - Hazardous Wastes - Discarded Chemical Products, Off-Specification Species, Container and Spill Residues**
**U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)**
**U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)**
**U.S. - Connecticut - Volatile Substances**
**U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities**
**U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities**
**U.S. - Florida - Essential Chemicals List**
**U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations**
**U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)**
**U.S. - Idaho - Occupational Exposure Limits - TWAs**
**U.S. - Louisiana - Reportable Quantity List for Pollutants**
**U.S. - Massachusetts - Allowable Ambient Limits (AALs)**
**U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)**
**U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1**
**U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2**
**U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity**
**U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1**
**U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2**
**U.S. - Massachusetts - Right To Know List**
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**U.S. - Massachusetts - Toxics Use Reduction Act**
**U.S. - Michigan - Occupational Exposure Limits - STELs**
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**U.S. - Minnesota - Hazardous Substance List**
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**U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual**
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**U.S. - New Jersey - Environmental Hazardous Substances List**
**U.S. - New Jersey - Right to Know Hazardous Substance List**
**U.S. - New Jersey - Special Health Hazards Substances List**
**U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)**
**U.S. - New Jersey - Water Quality - Ground Water Quality Criteria**
**U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)**
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**U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances**
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**U.S. - Washington - Permissible Exposure Limits - TWAs**

### Hydrogen fluoride (7664-39-3)

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**U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic**
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**U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities**
**U.S. - Delaware - Accidental Release Prevention Regulations - Toxic Endpoints**
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**U.S. - Idaho - Occupational Exposure Limits - TWAs**
**U.S. - Illinois - Toxic Air Contaminants**

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BORON TRIFLUORIDE ETHERATE
Safety Data Sheet

Boron trifluoride etherate (109-63-7)

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U.S. - Maine - Air Pollutants - Hazardous Air Pollutants
U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
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U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TEIs)
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Occupational Exposure Limits - STELs
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U.S. - Michigan - Polluting Materials List
U.S. - Michigan - Process Safety Management Highly Hazardous Chemicals
U.S. - Minnesota - Chemicals of High Concern
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U.S. - Minnesota - Permissible Exposure Limits - STELs
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New York - Occupational Exposure Limits - TWAs
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances
U.S. - North Carolina - Control of Toxic Air Pollutants
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 1-Hour
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - North Dakota - Hazardous Wastes - Discarded Chemical Products, Off-Specification Species, Container and Spill Residues
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Ohio - Extremely Hazardous Substances - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour
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U.S. - Tennessee - Occupational Exposure Limits - STELs
U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Effects Screening Levels - Long Term
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U.S. - Vermont - Hazardous Waste - Hazardous Constituents
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U.S. - Washington - Dangerous Waste - Dangerous Waste Constituents List
U.S. - Washington - Dangerous Waste - Discarded Chemical Products List
U.S. - Washington - Permissible Exposure Limits - Ceilings
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet
U.S. - Wyoming - Process Safety Management - Highly Hazardous Chemicals

SECTION 16: Other information

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.
- Full text of H-phrases:
  - Acute Tox. 4 (Oral)
  - Eye Dam. 1
  - Flam. Liq. 1
  - Flam. Liq. 3

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## BORON TRIFLUORIDE ETHERATE

### Safety Data Sheet

<table>
<thead>
<tr>
<th>Skin Corr. 1A</th>
<th>Skin corrosion/irritation Category 1A</th>
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<tbody>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity (single exposure) Category 3</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity (single exposure) Category 3</td>
</tr>
<tr>
<td>H224</td>
<td>Extremely flammable liquid and vapor</td>
</tr>
<tr>
<td>H226</td>
<td>Flammable liquid and vapor</td>
</tr>
<tr>
<td>H302</td>
<td>Harmful if swallowed</td>
</tr>
<tr>
<td>H314</td>
<td>Causes severe skin burns and eye damage</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation</td>
</tr>
<tr>
<td>H336</td>
<td>May cause drowsiness or dizziness</td>
</tr>
</tbody>
</table>

### HMIS III Rating

- **Health**: 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or repeated overexposures
- **Flammability**: 2 Moderate Hazard
- **Physical**: 1 Slight Hazard

Prepared by safety and environmental affairs.

**Date of issue**: 03/03/2015  
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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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