1 - Product and Company Information

Product Name: BORON TRIFLUORIDE ETHYL ETHERATE
Product Number: 15720
Company: Sigma-Aldrich Pte Ltd
#08-01 Citilink Warehouse
Singapore 118529
Singapore
Technical Phone #: 65 271 1089
Fax: 65 271 1571

2 - Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Product Name</th>
<th>CAS #</th>
<th>EC no</th>
<th>Annex I Index Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>BORON TRIFLUORIDE DIETHYL ETHERATE</td>
<td>109-63-7</td>
<td>203-689-8</td>
<td>None</td>
</tr>
</tbody>
</table>

Formula: (C2H5)2O · BF3
Molecular Weight: 141.93 AMU

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Flammable. Reacts violently with water. Harmful by inhalation and if swallowed. Causes severe burns. Toxic: danger of serious damage to health by prolonged exposure through inhalation.

4 - First Aid Measures

AFTER INHALATION
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION
If swallowed, wash out mouth with water provided person is conscious. Call a physician. Do not induce vomiting.

5 - Fire Fighting Measures

CONDITIONS OF FLAMMABILITY
Water hydrolyzes material liberating acidic gas which in contact
with metal surfaces can generate flammable and/or explosive hydrogen gas.

**EXTINGUISHING MEDIA**
Suitable: Dry chemical powder. Carbon dioxide.
Unsuitable: Do not use water.

**SPECIAL RISKS**
Specific Hazard(s): Combustible liquid. Emits toxic fumes under fire conditions.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS**
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

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6 - Accidental Release Measures

**PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL**
Evacuate area. Shut off all sources of ignition.

**PROCEDURE(S) OF PERSONAL PRECAUTION(S)**
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

**METHODS FOR CLEANING UP**
Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

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7 - Handling and Storage

**HANDLING**
Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

**STORAGE**
Conditions of Storage: Keep tightly closed. Keep away from heat, sparks, and open flame. Store under nitrogen.
Incompatible Materials: Do not allow contact with water

**SPECIAL REQUIREMENTS:** Store under inert gas.

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8 - Exposure Controls / Personal Protection

**ENGINEERING CONTROLS**
Safety shower and eye bath. Use only in a chemical fume hood.

**GENERAL HYGIENE MEASURES**
Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

**PERSONAL PROTECTIVE EQUIPMENT**
Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.
Special Protective Measures: Faceshield (8-inch minimum).

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9 - Physical and Chemical Properties

**Appearance**
Physical State: Liquid
Property | Value | At Temperature or Pressure
--- | --- | ---
pH | N/A | 
BP/BP Range | 128 °C | 
MP/MP Range | -58 °C | 
Flash Point | 48 °C | Method: closed cup
Flammability | N/A | 
Autoignition Temp | N/A | 
Oxidizing Properties | N/A | 
Explosive Properties | N/A | 
Explosion Limits | Lower: 1.9 %, Upper: 36 % | 
Vapor Pressure | 4.2 mmHg | 20 °C
SG/Density | 1.13 g/cm³ | 
Partition Coefficient | N/A | 
Viscosity | N/A | 
Vapor Density | 4.9 g/l | 
Saturated Vapor Conc. | N/A | 
Evaporation Rate | N/A | 
Bulk Density | N/A | 
Decomposition Temp. | N/A | 
Solvent Content | N/A | 
Water Content | N/A | 
Surface Tension | N/A | 
Conductivity | N/A | 
Miscellaneous Data | N/A | 
Solubility | N/A | 

10 - Stability and Reactivity

STABILITY
Stable: Stable.
Reactions to Avoid: Water hydrolyzes material liberating acidic gas which in contact with metal surfaces can generate flammable and/or explosive hydrogen gas.
Conditions to Avoid: Do not allow water to enter container because of violent reaction.
Materials to Avoid: Avoid contact with metals., Acids, Bases, Alcohols, Alkali metals

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen fluoride, Boron oxides.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

11 - Toxicological Information

SIGNS AND SYMPTOMS OF EXPOSURE
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.
Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.
Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

ROUTE OF EXPOSURE
Skin Contact: Causes severe burns.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes severe burns.
Inhalation: Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Harmful if inhaled.
Ingestion: Harmful if swallowed.

TARGET ORGAN INFORMATION

Kidneys.

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR
UN#: 2604
Class: 8
PG: I
Proper Shipping Name: Boron trifluoride diethyl etherate

IMDG
UN#: 2604
Class: 8
PG: I
Subrisk: 3
Proper Shipping Name: Boron trifluoride diethyl etherate
Marine Pollutant: No
Severe Marine Pollutant: No

IATA
UN#: 2604
Class: 8
PG: I
Subrisk: 3
Proper Shipping Name: Boron trifluoride diethyl etherate
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
INDICATION OF DANGER: T
Toxic.
R-PHRASES: 10 14 20/22 35 48/23
Flammable. Reacts violently with water. Harmful by inhalation and if swallowed. Causes severe burns. Toxic: danger of serious damage to health by prolonged exposure through inhalation.
S-PHRASES: 16 23 26 36/37/39 45
Keep away from sources of ignition - no smoking. Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable
protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

SWITZERLAND
SWISS POISON CLASS: 2

16 - Other Information

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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