

# Borontrifluoride etherate

## Safety Data Sheet 6160301

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

Date of issue: 02/09/2016

Version: 1.0

### SECTION 1: Identification

#### 1.1. Identification

|                               |  |
|-------------------------------|--|
| Product form                  | : Substance  |
| Substance name                | : Borontrifluoride etherate                        |
| CAS No                        | : 109-63-7   |
| Product code                  | : 6160-3-01  |
| Formula                       | : C <sub>4</sub> H <sub>10</sub> BF <sub>3</sub> O |
| Synonyms                      | : Boron trifluoride diethyl etherate               |
| Other means of identification | : MFCD00013194                                     |

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

|                              |  |
|------------------------------|--|
| Use of the substance/mixture | : Laboratory chemicals<br>Manufacture of substances<br>Scientific research and development |
|------------------------------|--|

#### 1.3. Details of the supplier of the safety data sheet

SynQuest Laboratories, Inc.  
P.O. Box 309  
Alachua, FL 32615 - United States of America  
T (386) 462-0788 - F (386) 462-7097  
[info@synquestlabs.com](mailto:info@synquestlabs.com) - [www.synquestlabs.com](http://www.synquestlabs.com)

#### 1.4. Emergency telephone number

Emergency number : (844) 523-4086 (3E Company - Account 10069)

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### Classification (GHS-US)

|                           |   |
|---------------------------|---|
| Flam. Liq. 3              | H226 - Flammable liquid and vapour                                    |
| Acute Tox. 4 (Oral)       | H302 - Harmful if swallowed   |
| Acute Tox. 1 (Inhalation) | H330 - Fatal if inhaled   |
| Skin Corr. 1A             | H314 - Causes severe skin burns and eye damage                        |
| Eye Dam. 1                | H318 - Causes serious eye damage                                      |
| STOT SE 3                 | H335 - May cause respiratory irritation                               |
| STOT RE 1                 | H372 - Causes damage to organs through prolonged or repeated exposure |

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  
H330 - Fatal if inhaled  
H335 - May cause respiratory irritation  
H372 - Causes damage to organs through prolonged or repeated exposure

Precautionary statements (GHS-US)

: P210 - Keep away from heat/sparks/open flames/hot surfaces. No smoking  
P233 - Keep container tightly closed  
P240 - Ground/bond container and receiving equipment  
P241 - Use explosion-proof electrical/ventilating/lighting equipment  
P242 - Use only non-sparking tools  
P243 - Take precautionary measures against static discharge  
P260 - Do not breathe dust/fume/gas/mist/vapors/spray  
P264 - Wash skin thoroughly after handling  
P270 - Do not eat, drink or smoke when using this product

# Borontrifluoride etherate

## Safety Data Sheet

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

P271 - Use only outdoors or in a well-ventilated area  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P284 - In case of inadequate ventilation wear respiratory protection  
P301+P312 - If swallowed: Call a POISON CENTER or doctor/ physician if you feel unwell  
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting  
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 POISON CENTER or doctor/ physician  
P314 - Get medical advice/attention if you feel unwell  
P320 - Specific treatment is urgent (see supplemental first aid instructions on this label)  
P321 - Specific treatment (see supplemental first aid instructions on this label)  
P330 - Rinse mouth  
P363 - Wash contaminated clothing before reuse  
P370+P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed  
P403+P235 - Store in a well-ventilated place. Keep cool  
P405 - Store locked up  
P501 - Dispose of contents/container to an approved waste disposal plant

### 2.3. Other hazards

Other hazards not contributing to the classification : Reacts violently with water.

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substance

Substance type : Mono-constituent

| Name  | Product identifier | %      | Classification (GHS-US)   |
|---|--------------------|--------|---|
| Borontrifluoride etherate<br>(Main constituent) | (CAS No) 109-63-7  | <= 100 | Flam. Liq. 3, H226<br>Acute Tox. 4 (Oral), H302<br>Acute Tox. 1 (Inhalation), H330<br>Skin Corr. 1A, H314<br>Eye Dam. 1, H318<br>STOT SE 3, H335<br>STOT RE 1, H372 |

Full text of H-phrases: see section 16

### 3.2. Mixture

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Move the affected personnel away from the contaminated area.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Get immediate medical advice/attention.

First-aid measures after skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. In case of skin contact, wearing rubber gloves rub 2.5% calcium gluconate gel continuously into the affected area for 1.5 hours or until further medical care is available. 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 : Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get immediate medical advice/attention.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

Symptoms/injuries after inhalation : Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea.

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Absorption of excessive F- can result in acute systemic fluorosis with hypocalcemia, interference with various metabolic functions and organ damage (heart, liver, kidneys).

# Borontrifluoride etherate

## Safety Data Sheet

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

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media : Alcohol resistant foam. Carbon dioxide. Dry powder. Water spray. Use extinguishing media appropriate for surrounding fire.

#### 5.2. Special hazards arising from the substance or mixture

Fire hazard : Thermal decomposition generates: Carbon oxides. Borane/boron oxides. Hydrogen fluoride.  
Explosion hazard : Risk of explosion if heated under confinement. Use water spray or fog for cooling exposed containers. May form flammable/explosive vapor-air mixture.  
Reactivity : Reacts with water, generates gases or heat. Reacts on exposure to water with some metals to release highly explosive/flammable hydrogen gas.

#### 5.3. Advice for firefighters

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.  
Protection during firefighting : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. For further information refer to section 8: "Exposure controls/personal protection".

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate unnecessary personnel. Ensure adequate air ventilation. Do not breathe gas, fumes, vapor or spray.

##### 6.1.1. For non-emergency personnel

Emergency procedures : Only qualified personnel equipped with suitable protective equipment may intervene.

##### 6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".  
Emergency procedures : Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level. Consider the risk of potentially explosive atmospheres. Eliminate every possible source of ignition.

#### 6.2. Environmental precautions

Avoid release to the environment. Notify authorities if product enters sewers or public waters.

#### 6.3. Methods and material for containment and cleaning up

For containment : Stop leak if safe to do so. Dike for recovery or absorb with appropriate material.  
Methods for cleaning up : Take up large spills with pump or vacuum and finish with dry chemical absorbent. Use explosion-proof equipment. Take up small spills with dry chemical absorbent. Sweep or shovel spills into appropriate container for disposal. Ventilate area.  
Other information : For disposal of solid materials or residues refer to section 13 : "Disposal considerations".

#### 6.4. Reference to other sections

No additional information available

### 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.  
Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Ensure good ventilation of the work station. Do not breathe fumes, mist, spray, vapors. Wear personal protective equipment. Avoid contact with skin and eyes. Keep away from ignition sources (including static discharges). Proper grounding procedures to avoid static electricity should be followed. Use only non-sparking tools.  
Hygiene measures : Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

#### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Comply with applicable regulations.  
Storage conditions : Keep container closed when not in use. Keep away from ignition sources. Keep contents under inert gas.  
Incompatible materials : Refer to Section 10 on Incompatible Materials.  
Storage temperature : 2 - 8 °C Use explosion proof refrigerator  
Prohibitions on mixed storage : Do not store with: Acids.  
Storage area : Store in dry, well-ventilated area.

# Borontrifluoride etherate

## Safety Data Sheet

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

Special rules on packaging : Do not store in glass.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available

#### 8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection : Protective gloves. 29 CFR 1910.138: Hand Protection.

Eye protection : Chemical goggles or safety glasses. Face shield. 29 CFR 1910.133: Eye and Face Protection.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : In case of inadequate ventilation wear respiratory protection. 29 CFR 1910.134: Respiratory Protection.

Other information : Safety shoes. 29 CFR 1910.136: Foot Protection.

### SECTION 9: Physical and chemical properties

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

Physical state : Liquid

Color : No data available

Odor : No data available

Odor threshold : No data available

pH : No data available

Melting point : -58 °C

Freezing point : No data available

Boiling point : 126 - 129 °C

Flash point : 47 °C

Relative evaporation rate (butyl acetate=1) : No data available

Flammability (solid, gas) : No data available

Explosion limits : No data available

Explosive properties : No data available

Oxidizing properties : No data available

Vapor pressure : 4.2 mm Hg (@ 20 °C)

Relative density : No data available

Relative vapor density at 20 °C : No data available

Specific gravity / density : 1.15 g/ml (@ 20 °C)

Molecular mass : 141.93 g/mol

Solubility : No data available

Log Pow : No data available

Auto-ignition temperature : No data available

Decomposition temperature : No data available

Viscosity : No data available

Viscosity, kinematic : No data available

Viscosity, dynamic : No data available

#### 9.2. Other information

Refractive index : 1.344 (@ 20 °C)

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

Reacts with water, generates gases or heat. Reacts on exposure to water with some metals to release highly explosive/flammable hydrogen gas.

#### 10.2. Chemical stability

The product is stable at normal handling and storage conditions.

# Borontrifluoride etherate

## Safety Data Sheet

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

### 10.3. Possibility of hazardous reactions

Contact with acids liberates toxic gas. Contact with water liberates toxic gas.

### 10.4. Conditions to avoid

Keep away from heat, sparks and flame.

### 10.5. Incompatible materials

Acids. Alcohols. Alkali metals. Metals. Bases. Glass. Oxidizing agents. Water.

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products in case of fire, see Section 5.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Inhalation: Fatal if inhaled.

| Borontrifluoride etherate (109-63-7) |                           |
|--------------------------------------|---------------------------|
| ATE US (oral)                        | 500.000 mg/kg body weight |
| ATE US (gases)                       | 10.000 ppmV/4h            |
| ATE US (vapors)                      | 0.050 mg/l/4h             |
| ATE US (dust, mist)                  | 0.005 mg/l/4h             |

|   |  |
|---|--|
| Skin corrosion/irritation                           | : Causes severe skin burns and eye damage.   |
| Serious eye damage/irritation                       | : Causes serious eye damage.   |
| Respiratory or skin sensitization                   | : Not classified   |
| Germ cell mutagenicity                              | : Not classified   |
| Carcinogenicity                                     | : Not classified   |
| Reproductive toxicity                               | : Not classified   |
| Specific target organ toxicity (single exposure)    | : May cause respiratory irritation.  |
| Specific target organ toxicity (repeated exposure)  | : Causes damage to organs through prolonged or repeated exposure.  |
| Aspiration hazard                                   | : Not classified   |
| Potential Adverse human health effects and symptoms | : Absorption of excessive F- can result in acute systemic fluorosis with hypocalcemia, interference with various metabolic functions and organ damage (heart, liver, kidneys). |
| Symptoms/injuries after inhalation                  | : Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea.  |

## 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

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

|                                |   |
|--------------------------------|---|
| Waste treatment methods        | : Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber.   |
| Waste disposal recommendations | : Dispose of contents/container in accordance with licensed collector's sorting instructions. |
| Additional information         | : Recycle the material as far as possible.  |

# Borontrifluoride etherate

## Safety Data Sheet

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

### SECTION 14: Transport information

#### Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN2604 Boron trifluoride diethyl etherate, 8, I

UN-No.(DOT) : UN2604

Proper Shipping Name (DOT) : Boron trifluoride diethyl etherate

Transport hazard class(es) (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 Non Bulk (49 CFR 173.xxx) : 201

DOT Packaging Bulk (49 CFR 173.xxx) : 243

DOT Special Provisions (49 CFR 172.102) : A3 - For combination packaging, if glass inner packaging (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packaging.  
A19 - Combination packaging consisting of outer fiber drums or plywood drums, with inner plastic packaging, are not authorized for transportation by aircraft.  
T10 - 4 6 mm Prohibited 178.275(g)(3).  
TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where:  $t_r$  is the maximum mean bulk temperature during transport,  $t_f$  is the temperature in degrees celsius of the liquid during filling, and  $a$  is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling ( $t_f$ ) and the maximum mean bulk temperature during transportation ( $t_r$ ) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where:  $d_{15}$  and  $d_{50}$  are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.

DOT Packaging Exceptions (49 CFR 173.xxx) : None

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

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"

Emergency Response Guide (ERG) Number : 132

Other information : No supplementary information available.

#### TDG

No additional information available

#### Transport by sea

UN-No. (IMDG) : 2604

Proper Shipping Name (IMDG) : BORON TRIFLUORIDE DIETHYL ETHERATE

Class (IMDG) : 8 - Corrosive substances

Packing group (IMDG) : I - substances presenting high danger

#### Air transport

UN-No. (IATA) : 2604

Proper Shipping Name (IATA) : Boron trifluoride diethyl etherate

Class (IATA) : 8 - Corrosives

Packing group (IATA) : I - Great Danger

# Borontrifluoride etherate

## Safety Data Sheet

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

### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

##### Borontrifluoride etherate (109-63-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

#### 15.2. International regulations

##### CANADA

##### Borontrifluoride etherate (109-63-7)

Listed on the Canadian DSL (Domestic Substances List)

##### EU-Regulations

No additional information available

##### National regulations

##### Borontrifluoride etherate (109-63-7)

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  
Listed on the Korean ECL (Existing Chemicals List)  
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 the Canadian IDL (Ingredient Disclosure List)  
Listed on INSQ (Mexican national Inventory of Chemical Substances)  
Listed on the TCSI (Taiwan Chemical Substance Inventory)

#### 15.3. US State regulations

##### Borontrifluoride etherate (109-63-7)

|                            |   |
|----------------------------|---|
| State or local regulations | U.S. - Massachusetts - Right To Know List<br>U.S. - New Jersey - Right to Know Hazardous Substance List<br>U.S. - Pennsylvania - RTK (Right to Know) List |
|----------------------------|---|

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

### SECTION 16: Other information

Full text of H-phrases:

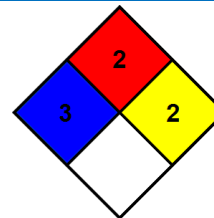
|                           |  |
|---------------------------|--|
| Acute Tox. 1 (Inhalation) | Acute toxicity (inhalation) Category 1                         |
| Acute Tox. 4 (Oral)       | Acute toxicity (oral) Category 4                               |
| Eye Dam. 1                | Serious eye damage/eye irritation Category 1                   |
| Flam. Liq. 3              | Flammable liquids Category 3                                   |
| Skin Corr. 1A             | Skin corrosion/irritation Category 1A                          |
| STOT RE 1                 | Specific target organ toxicity (repeated exposure) Category 1  |
| STOT SE 3                 | Specific target organ toxicity (single exposure) Category 3    |
| H226                      | Flammable liquid and vapor                                     |
| H302                      | Harmful if swallowed   |
| H314                      | Causes severe skin burns and eye damage                        |
| H318                      | Causes serious eye damage                                      |
| H330                      | Fatal if inhaled   |
| H335                      | May cause respiratory irritation                               |
| H372                      | Causes damage to organs through prolonged or repeated exposure |

# Borontrifluoride etherate

## Safety Data Sheet

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

|                    |   |
|--------------------|---|
| NFPA health hazard | : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.   |
| NFPA fire hazard   | : 2 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.  |
| NFPA reactivity    | : 2 - Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.  |
| HMIS III Rating    |   |
| Health             | : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given<br>* - Chronic (long-term) health effects may result from repeated overexposure   |
| Flammability       | : 2 Moderate Hazard - Materials which must be moderately heated or exposed to high ambient temperatures before ignition will occur. Includes liquids having a flash point at or above 100 F but below 200 F. (Classes II & IIIA)            |
| Physical           | : 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air. |



SDS US (GHS HazCom 2012)

*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 offered solely for your consideration, investigation, and verification. It does not represent any guarantee of the properties of the product nor that the hazard precautions or procedures described are the only ones which exist. SynQuest shall not be held liable or any damage resulting from handling or from contact with the above product.*