Material Safety Data Sheet

Version 4.4
Revision Date 11/03/2011
Print Date 11/22/2011

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Boron trifluoride diethyl etherate

Product Number : 175501
Brand : Aldrich

Supplier : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # (For both supplier and manufacturer) : (314) 776-6555
Preparation Information : Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Combustible Liquid, Target Organ Effect, Toxic by inhalation., Harmful by ingestion., Corrosive

Target Organs

Kidney

Other hazards which do not result in classification
Reacts violently with water.

GHS Classification
Flammable liquids (Category 3)
Acute toxicity, Inhalation (Category 2)
Acute toxicity, Oral (Category 4)
Skin corrosion (Category 1A)
Serious eye damage (Category 1)
Specific target organ toxicity - repeated exposure, Inhalation (Category 1)

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H330	Fatal if inhaled.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.

Precautionary statement(s)

P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
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.

HMIS Classification

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	2
Physical hazards:	2

NFPA Rating

Health hazard:	3
Fire:	2
Reactivity Hazard:	0

Potential Health Effects

Inhalation	Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	Harmful if absorbed through skin. Causes skin burns.
Eyes	Causes eye burns. Causes severe eye burns.
Ingestion	Harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Boron trifluoride ethyl etherate

Formula : $BF_3 \cdot C_4H_{10}O$
Molecular Weight : 141.93 g/mol

Component	Concentration
Diethyl ether-boron trifluoride	
CAS-No. 109-63-7 EC-No. 203-689-8	

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Conditions of flammability
Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

Suitable extinguishing media
Dry powder

Special protective equipment for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen fluoride, Borane/boron oxides

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Store under nitrogen. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep away from water.Never allow product to get in contact with water during storage.

Recommended storage temperature: 2 - 8 °C

Store under inert gas.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	no data available

Safety data

pH	no data available
Melting point/freezing point	Melting point/range: -58 °C (-72 °F)
Boiling point	126 - 129 °C (259 - 264 °F)
Flash point	48 °C (118 °F) - closed cup
Ignition temperature	no data available
Autoignition temperature	no data available
Lower explosion limit	1.9 %(V)
Upper explosion limit	36 %(V)
Vapour pressure	5.6 hPa (4.2 mmHg) at 20 °C (68 °F)
Density	1.15 g/mL
Water solubility	no data available
Partition coefficient: n-octanol/water	no data available
Relative vapour density	4.90 - (Air = 1.0)
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions

Reacts violently with water.

Conditions to avoid
Water hydrolyzes material liberating acidic gas which in contact with metal surfaces can generate flammable and/or explosive hydrogen gas. Do not allow water to enter container because of violent reaction.
Heat, flames and sparks. Exposure to moisture.

Materials to avoid
Metals, acids, Bases, Alcohols, Alkali metals, Oxidizing agents, Water

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen fluoride, Borane/boron oxides
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
no data available

Inhalation LC50
LC50 Inhalation - rat - 4 h - 1.2 mg/l

Dermal LD50
no data available

Other information on acute toxicity
no data available

Skin corrosion/irritation
Serious eye damage/eye irritation
Eyes - rabbit - Corrosive to eyes

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
Inhalation - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
no data available

Potential health effects

Inhalation	Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion	Harmful if swallowed.
Skin	Harmful if absorbed through skin. Causes skin burns.
Eyes	Causes eye burns. Causes severe eye burns.

Signs and Symptoms of Exposure
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting

Synergistic effects

no data available

Additional Information
RTECS: Not available

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	field study LC50 - Leuciscus idus (Golden orfe) - 22 - 46 mg/l

Persistence and degradability
Biodegradability Result: - Partially biodegradable.

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2604 Class: 8 (3) Packing group: I
Proper shipping name: Boron trifluoride diethyl etherate
Reportable Quantity (RQ):
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 2604 Class: 8 (3) Packing group: I EMS-No: F-E, S-C
Proper shipping name: BORON TRIFLUORIDE DIETHYL ETHERATE
Marine pollutant: No

IATA
UN number: 2604 Class: 8 (3) Packing group: I
Proper shipping name: Boron trifluoride diethyl etherate

15. REGULATORY INFORMATION

OSHA Hazards
Combustible Liquid, Target Organ Effect, Toxic by inhalation., Harmful by ingestion., Corrosive

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Diethyl ether-boron trifluoride	109-63-7	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Diethyl ether-boron trifluoride	109-63-7	2007-03-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

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 Co., 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.