

ALFAA22874

## Boron trifluoride

### SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

**产品说明:**  
**Product Description:** 三氟化硼  
 Boron trifluoride

**Cat No. :** 22874  
**CAS No** 7637-07-2  
**Molecular Formula** BF<sub>3</sub>

**Supplier** Alfa Aesar  
 Avocado Research Chemicals, Ltd.  
 Shore Road  
 Port of Heysham Industrial Park  
 Heysham, Lancashire LA3 2XY  
 United Kingdom  
 Office Tel: +44 (0) 1524 850506  
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**Emergency Telephone Number** Call Carechem 24 at  
 +44 (0) 1865 407333 (English only);  
 +44 (0) 1235 239670 (Multi-language)

**E-mail address** uktech@alfa.com  
 www.alfa.com  
 Product Safety Department

**Recommended Use** Laboratory chemicals.  
**Uses advised against** No Information available

### SECTION 2. HAZARD IDENTIFICATION

**Physical State**  
Gas

**Appearance**  
Colorless

**Odor**  
pungent

#### Emergency Overview

Contains gas under pressure; may explode if heated. Fatal if inhaled. Causes severe skin burns and eye damage. Corrosive to the respiratory tract. May cause damage to organs through prolonged or repeated exposure. Reacts violently with water.

#### Classification of the substance or mixture

Gases under pressure.	Liquefied gas
Acute Inhalation Toxicity - Gas	Category 2
Skin Corrosion/Irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity - (repeated exposure)	Category 2

#### Label Elements

**Signal Word****Danger****Hazard Statements**

H280 - Contains gas under pressure; may explode if heated  
H330 - Fatal if inhaled  
H314 - Causes severe skin burns and eye damage  
H372 - Causes damage to organs through prolonged or repeated exposure

**Precautionary Statements****Prevention**

P264 - Wash face, hands and any exposed skin thoroughly after handling  
P271 - Use only outdoors or in a well-ventilated area  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P284 - Wear respiratory protection

**Response**

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 or 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  
P362 + P364 - Take off contaminated clothing and wash it before reuse

**Storage**

P410 + P403 - Protect from sunlight. Store in a well-ventilated place  
P405 - Store locked up

**Disposal**

P501 - Dispose of contents/ container to an approved waste disposal plant

**Physical and Chemical Hazards**

None identified.

**Health Hazards**

The product contains no substances which at their given concentration are considered to be hazardous to health.

**Environmental hazards**

Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants. Will likely be mobile in the environment due to its volatility. The product evaporates readily.

**Other Hazards**

Contact with product may cause frostbite

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS No	Weight %
Boron trifluoride	7637-07-2	<=100

**SECTION 4. FIRST AID MEASURES****General Advice**

Remove from exposure, lie down. Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

**Eye Contact**

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

**Skin Contact**

Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.

**Inhalation**

Remove to fresh air. Get medical attention immediately if symptoms occur.

**Ingestion**

Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.

**Most important symptoms and effects**

None reasonably foreseeable. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

**Self-Protection of the First Aider**

No special precautions required.

**Notes to Physician**

Effects of contact or inhalation may be delayed. Delayed pulmonary edema may occur. This product contains hydrogen fluoride. Generous application of calcium gluconate gel to the affected skin may be indicated.

**SECTION 5. FIRE-FIGHTING MEASURES****Suitable Extinguishing Media**

CO<sub>2</sub>, dry chemical, dry sand, alcohol-resistant foam. Water mist may be used to cool closed containers.

**Extinguishing media which must not be used for safety reasons**

Water.

**Specific Hazards Arising from the Chemical**

Reacts violently with water. Cylinders exposed to fire may vent and release toxic and/or corrosive gas through pressure relief devices.

**Protective Equipment and Precautions for Firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**SECTION 6. ACCIDENTAL RELEASE MEASURES****Personal Precautions**

Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation. Do not get water inside containers

**Environmental Precautions**

Should not be released into the environment.

**Methods for Containment and Clean Up**

Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

Refer to protective measures listed in Sections 8 and 13.

**SECTION 7. HANDLING AND STORAGE****Handling**

Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation. Avoid dust formation.

## Boron trifluoride

**Storage**

Keep at temperatures below 50°C. Corrosives area. Keep away from water or moist air. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep cool and protect from sunlight.

**Specific Use(s)**

Use in laboratories

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Control Parameters**

Component	China	Taiwan	Hong Kong	The United Kingdom
Boron trifluoride	Ceiling: 3 mg/m <sup>3</sup>	TWA: 2.5 mg/m <sup>3</sup>	Ceiling: 1 ppm Ceiling: 2.8 mg/m <sup>3</sup>	-

Component	ACGIH TLV	OSHA PEL	NIOSH	European Union
Boron trifluoride	TWA: 0.1 ppm TWA: 2.5 mg/m <sup>3</sup> Ceiling: 0.7 ppm	(Vacated) TWA: 2.5 mg/m <sup>3</sup> Ceiling: 1 ppm Ceiling: 3 mg/m <sup>3</sup> (Vacated) Ceiling: 1 ppm (Vacated) Ceiling: 3 mg/m <sup>3</sup>	IDLH: 25 ppm IDLH: 250 mg/m <sup>3</sup> Ceiling: 1 ppm Ceiling: 3 mg/m <sup>3</sup>	

**Monitoring methods**

BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. MDHS70 General methods for sampling airborne gases and vapours

**Exposure Controls****Engineering Measures**

None under normal use conditions. .

**Personal protective equipment****Eye Protection**

Face protection shield or Goggles (European standard - EN 166)

**Hand Protection**

Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Neoprene	See manufacturers recommendations	-	EN 374	(minimum requirement)

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves.

(Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

**Skin and body protection**

Long sleeved clothing

**Respiratory Protection**

No protective equipment is needed under normal use conditions.

**Large scale/emergency use**

Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

**Recommended Filter type:** Particle filter

**Small scale/Laboratory use**

Maintain adequate ventilation

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

## Boron trifluoride

**Environmental exposure controls** Prevent product from entering drains.**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance</b>	Colorless	
<b>Physical State</b>	Gas	
<b>Odor</b>	pungent	
<b>Odor Threshold</b>	No data available	
<b>pH</b>	Not applicable	
<b>Melting Point/Range</b>	-127.1 °C / -196.8 °F	
<b>Softening Point</b>	No data available	
<b>Boiling Point/Range</b>	-100.4 °C / -148.7 °F	
<b>Flash Point</b>	No information available	<b>Method -</b> No information available
<b>Evaporation Rate</b>	No data available	
<b>Flammability (solid,gas)</b>	No information available	
<b>Explosion Limits</b>	No data available	
<b>Vapor Pressure</b>	No data available	
<b>Vapor Density</b>	No data available	(Air = 1.0)
<b>Specific Gravity / Density</b>	0.003076 g/cm3	@ 20 °C
<b>Bulk Density</b>	No data available	
<b>Water Solubility</b>	No information available	
<b>Solubility in other solvents</b>	No information available	
<b>Partition Coefficient (n-octanol/water)</b>		
<b>Autoignition Temperature</b>	No data available	
<b>Decomposition Temperature</b>	No data available	
<b>Viscosity</b>	No data available	
<b>Explosive Properties</b>	No information available	
<b>Oxidizing Properties</b>	No information available	
<b>Molecular Formula</b>	BF3	
<b>Molecular Weight</b>	67.81	

**SECTION 10. STABILITY AND REACTIVITY**

<b>Stability</b>	Moisture sensitive.
<b>Hazardous Reactions</b>	None under normal processing.
<b>Hazardous Polymerization</b>	No information available.
<b>Conditions to Avoid</b>	Exposure to moist air or water. Reacts with water, steam or acids to produce toxic vapors. Protect from sunlight and do not expose to temperatures exceeding 50 °C/122 °F.
<b>Materials to avoid</b>	Strong bases. Acids. Water. Oxidizing agent.

**Hazardous Decomposition Products** Oxides of boron. Hydrogen fluoride.**SECTION 11. TOXICOLOGICAL INFORMATION****Product Information****(a) acute toxicity;**

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Boron trifluoride			LC50 = 194 ppm ( Rat ) 4 h

(b) skin corrosion/irritation;	Category 1 A
(c) serious eye damage/irritation;	Category 1
(d) respiratory or skin sensitization; Respiratory Skin	Based on available data, the classification criteria are not met Based on available data, the classification criteria are not met
(e) germ cell mutagenicity;	Based on available data, the classification criteria are not met
(f) carcinogenicity;	Based on available data, the classification criteria are not met There are no known carcinogenic chemicals in this product
(g) reproductive toxicity;	Based on available data, the classification criteria are not met
(h) STOT-single exposure;	Based on available data, the classification criteria are not met
(i) STOT-repeated exposure; Target Organs	Category 2 None known.
(j) aspiration hazard;	Based on available data, the classification criteria are not met
Symptoms / effects, both acute and delayed	Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

## SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects Reacts violently with water.

Component	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Boron trifluoride		EC50: = 21.3 mg/L, 48h (Daphnia magna)		

## Persistence and Degradability

Persistence  
Degradability

Persistence is unlikely, based on information available.  
Not relevant for inorganic substances.

## Bioaccumulative Potential

Bioaccumulation is unlikely

## Mobility in soil

The product evaporates readily. Will likely be mobile in the environment due to its volatility  
Disperses rapidly in air

## Endocrine Disruptor Information

## Persistent Organic Pollutant

## Ozone Depletion Potential

This product does not contain any known or suspected endocrine disruptors

This product does not contain any known or suspected substance

This product does not contain any known or suspected substance

## SECTION 13. DISPOSAL CONSIDERATIONS

**Waste from Residues/Unused Products**

Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

**Contaminated Packaging**

Dispose of this container to hazardous or special waste collection point.

**Other Information**

Do not flush to sewer. Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

**SECTION 14. TRANSPORT INFORMATION****Road and Rail Transport**

UN-No UN1008  
Proper Shipping Name BORON TRIFLUORIDE  
Hazard Class 2.3  
Subsidiary Hazard Class 8

**IMDG/IMO**

UN-No UN1008  
Proper Shipping Name BORON TRIFLUORIDE  
Hazard Class 2.3  
Subsidiary Hazard Class 8

**IATA**

FORBIDDEN FOR IATA TRANSPORT

UN-No UN1008  
Proper Shipping Name BORON TRIFLUORIDE FORBIDDEN FOR IATA TRANSPORT  
Hazard Class 2.3  
Subsidiary Hazard Class 8

**Special Precautions for User**

No special precautions required

**SECTION 15. REGULATORY INFORMATION****International Inventories**

X = listed, China (IECSC), Europe (EINECS/ELINCS/NLP), U.S.A. (TSCA), Canada (DSL/NDL), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), Korea (KECL).

Component	The Inventory of Hazardous Chemicals (2015 Edition)	List of dangerous goods GB 12268 - 2012	TCSI	IECSC	EINECS	TSCA	DSL	PICCS	ENCS	ISHL	AICS	KECL
Boron trifluoride	X	X	X	X	231-569-5	X	X	X	X	X	X	KE-03541

Component	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Boron trifluoride	5 tonne	20 tonne

**National Regulations**

Component	Toxic Chemical Substances Control Act
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**SAFETY DATA SHEET****Boron trifluoride**

Boron trifluoride 7637-07-2 ( ≤100 )	Class IV (1 wt%)
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**SECTION 16. OTHER INFORMATION**

**Prepared By** Health, Safety and Environmental Department  
**Revision Date** 06-Jan-2023  
**Revision Summary** Not applicable.

**Training Advice**

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

**Legend**

**CAS** - Chemical Abstracts Service

**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**IECSC** - Chinese Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDL** - Canadian Domestic Substances List/Non-Domestic Substances List

**ENCS** - Japanese Existing and New Chemical Substances

**AICS** - Australian Inventory of Chemical Substances

**NZIoC** - New Zealand Inventory of Chemicals

**WEL** - Workplace Exposure Limit

**ACGIH** - American Conference of Governmental Industrial Hygienists

**DNEL** - Derived No Effect Level

**RPE** - Respiratory Protective Equipment

**LC50** - Lethal Concentration 50%

**NOEC** - No Observed Effect Concentration

**PBT** - Persistent, Bioaccumulative, Toxic

**TWA** - Time Weighted Average

**IARC** - International Agency for Research on Cancer

Predicted No Effect Concentration (PNEC)

**LD50** - Lethal Dose 50%

**EC50** - Effective Concentration 50%

**POW** - Partition coefficient Octanol:Water

**vPvB** - very Persistent, very Bioaccumulative

**ADR** - European Agreement Concerning the International Carriage of Dangerous Goods by Road

**IMO/IMDG** - International Maritime Organization/International Maritime Dangerous Goods Code

**OECD** - Organisation for Economic Co-operation and Development

**BCF** - Bioconcentration factor

**ICAO/IATA** - International Civil Aviation Organization/International Air Transport Association

**MARPOL** - International Convention for the Prevention of Pollution from Ships

**ATE** - Acute Toxicity Estimate

**VOC** - (Volatile Organic Compound)

**Key literature references and sources for data**

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of Safety Data Sheet**