Chemical Safety Data Sheet MSDS / SDS

Boron trifluoride SDS

Revision Date:2024-04-25 Revision Number:1

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

Product identifier

Product name: Boron trifluoride

CAS: 7637-07-2

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

Gases under pressure: Compressed gas
Skin corrosion, Sub-category 1A

Acute toxicity - Category 2, Inhalation

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H314 Causes severe skin burns and eye damage
H330 Fatal if inhaled

Precautionary statement(s)

Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash ... thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P271 Use only outdoors or in a well-ventilated area.
P284 [In case of inadequate ventilation] wear respiratory protection.

Response

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P363 Wash contaminated clothing before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316 Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P320 Specific treatment is urgent (see ... on this label).

Storage

P410+P403 Protect from sunlight. Store in a well-ventilated place.
P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Boron trifluoride
Common names and synonyms:	Boron trifluoride
CAS number:	7637-07-2
EC number:	231-569-5
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention.

Following skin contact

First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms/effects, acute and delayed

Highly toxic; may cause death or permanent injury after very short exposure to small quantities. Substance is irritating to the eyes, the skin, and the respiratory tract. (EPA, 1998)

Indication of immediate medical attention and special treatment needed, if necessary

If strong concentrations of boron trifluoride gas get into the eyes, wash eyes immediately with large amounts of water, lifting the lower and upper lids occasionally. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.

SECTION 5: Firefighting measures

Suitable extinguishing media

Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Use water spray to keep fire-exposed containers cool. Extinguish fire using agent suitable for surrounding fire.

Specific hazards arising from the chemical

When heated to decomposition or upon contact with water or steam, it will produce toxic and corrosive fumes of fluorine containing compounds. Decomposes upon heating or on contact with moist air, forming toxic and corrosive fumes of boric acid and hydrofluoric acid. Reacts with alkalis and fumes in moist air, producing particulates which reduce visibility. Reacts with alkali metals, alkaline earth metals (except magnesium), alkyl nitrates, and calcium oxide. It hydrolyzes in moist air to form boric acid, hydrofluoric acid, and fluoboric acid. (EPA, 1998)

Special protective actions for fire-fighters

In case of fire in the surroundings: use appropriate extinguishing media. In case of fire: keep cylinder cool by spraying with water. NO direct contact with water.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. NEVER direct water jet on liquid. Remove fumes with fine water spray.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. NEVER direct water jet on liquid. Remove fumes with fine water spray.

Methods and materials for containment and cleaning up

Approach release from upwind. Stop or control the leak, if this can be done without undue risk. Use water spray to cool and disperse vapors and protect personnel. Avoid wetting leak or spill area. Releases may require isolation or evacuation.

SECTION 7: Handling and storage

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Separated from alkali metals, alkaline earth metals, alkyl nitrates and lime. Cool.Store in cool, dry, well-ventilated location. Outside or detached storage is preferred. Separate from water, active metals, monomers.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	Boron trifluoride			
CAS No.	7637-07-2			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m^3	ppm	mg/m^3
Australia	?	?	1 (1)	2,8 (1)
Austria	1	3	1	3
Belgium	?	?	1	3
Canada - Ontario	?	?	1 (1)	?
Canada - Québec	?	?	1 (1)	2,8 (1)
Denmark	1	3	1	3
Finland	1	2,8	3 (1)	8,4 (1)

France	?	?	1	3
Germany (AGS)	0,35	1	0,7 (1)	2 (1)
Ireland	?	?	1 (1)	3 (1)
Japan - JSOH	0,3	0,83	?	?
Latvia	?	1	?	?
New Zealand	?	?	1 (1)	2,8 (1)
People's Republic of China	?	?	?	3 (1)
Poland	?	?	?	3 (1)
Singapore	?	?	1	2,8
South Korea	?	?	1 (1)	3 (1)
Spain	?	?	1	3
Switzerland	1	3	1	3
USA - NIOSH	?	?	1 (1)	3 (1)
USA - OSHA	?	?	1	3
United Kingdom	?	?	[1]	[2,8]

	Remarks
Australia	(1) Ceiling limit value
Canada - Ontario	(1) Ceiling limit value
Canada - Québec	(1) Ceiling limit value
Finland	(1) 15 minutes average value
Germany (AGS)	(1) 15 minutes average value
Ireland	(1) 15 minutes reference period
New Zealand	(1) Ceiling limit value
People's Republic of China	(1) Ceiling limit value
Poland	(1) Ceiling limit value
South Korea	(1) Ceiling limit value
USA - NIOSH	(1) Ceiling limit value
United Kingdom	The UK Advisory Committee on Toxic Substances has expressed concern that, for the OELs shown in parentheses, health may not be adequately protected because of doubts that the limit was not soundly-based. These OELs were included in the published UK 2002 list and its 2003 supplement, but are omitted from the published 2005 list.

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Cold-insulating gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Boron trifluoride is a colorless gas with a pungent odor. It is toxic by inhalation. It is soluble in water and slowly hydrolyzed by cold water to give off hydrofluoric acid, a corrosive material. Its vapors are heavier than air. Prolonged exposure of the containers to fire or heat may result in their violent rupturing and rocketing.
Colour:	Colorless gas
Odour:	Pungent, suffocating odor
Melting point/freezing point:	-20°C

Boiling point or initial boiling point and boiling range:	?100°C(lit.)
Flammability:	Nonflammable Gas
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	4°C
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	0.0171 m Pa.s (gas) at 25 deg C
Solubility:	106 % (in cold H2O) (NIOSH, 2016)
Partition coefficient n-octanol/water:	no data available
Vapour pressure:	760 mm Hg at -149.26° F Liquid (EPA, 1998)
Density and/or relative density:	0.87
Relative vapour density:	2.38 (21 °C, vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

The substance polymerizes unsaturated compounds. Decomposes on contact with water or moisture. This produces toxic and

corrosive fumes including hydrogen fluoride (see ICSC 0283), fluoroboric acid and boric acid. Reacts violently with metals such as sodium, potassium and calcium and alkyl nitrates alkyl nitrates. Attacks many metals in the presence of water.

Chemical stability

Boron trifluoride ... is stable in dry atmospheres.

Possibility of hazardous reactions

Nonflammable compressed gas.The gas is heavier than air.BORON TRIFLUORIDE is a colorless, strongly irritating, toxic gas. Upon contact with water, steam or when heated to decomposition, it will produce toxic fluoride fumes. Incompatible with alkyl nitrates, calcium oxide. Reaction with alkali metals or alkaline earth metals (except magnesium) will cause incandescence [Bretherick, 5th ed., 1995, p. 65].

Conditions to avoid

no data available

Incompatible materials

Boron trifluoride reacts with incandescence when heated with alkali metals or alkaline earth metals, except magnesium.

Hazardous decomposition products

Dangerous; when heated to decomposition or upon contact with water or steam, will produce toxic and corrosive fumes of /hydrogen fluoride/.

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: LC50 Rat (male) inhalation 387 (320-467) ppm/1 hr

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is corrosive to the eyes, skin and respiratory tract. Inhalation of high concentrations may cause lung oedema, but only after initial corrosive effects on the eyes and the upper respiratory tract have become manifest. See Notes. Rapid evaporation of the liquid may cause frostbite.

STOT-repeated exposure

The substance may have effects on the kidney, lungs and teeth and bones (fluorosis).

Aspiration hazard

A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50; Species: Lepomis macrochirus (Bluegill); Conditions: static; Concentration: 15 g/L for 24 hr /formulated product

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN1008 (For reference only, please check.)
IMDG: UN1008 (For reference only, please check.)
IATA: UN1008 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: BORON TRIFLUORIDE (For reference only, please check.)
IMDG: BORON TRIFLUORIDE (For reference only, please check.)
IATA: BORON TRIFLUORIDE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 2.3 (For reference only, please check.)
IMDG: 2.3 (For reference only, please check.)
IATA: 2.3 (For reference only, please check.)

Packing group, if applicable

ADR/RID: (For reference only, please check.)
IMDG: (For reference only, please check.)
IATA: (For reference only, please check.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

Boron trifluoride is soluble in cold water, 332 g/100 ml at 0°C. The occupational exposure limit value should not be exceeded during any part of the working exposure. Depending on the degree of exposure, periodic medical examination is suggested. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Immediate administration of an appropriate inhalation therapy by a doctor or a person authorized by him/her, should be considered.