

## Chemical Safety Data Sheet MSDS / SDS

## Boron trichloride

Revision Date:2024-03-16 Revision Number:1

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

## Product identifier

Product name : Boron trichloride  
CBnumber : CB8852623  
CAS : 10294-34-5  
EINECS Number : 233-658-4  
Synonyms : BCl<sub>3</sub>,boron trichloride

## 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  
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing  
Telephone : 400-158-6606

## SECTION 2: Hazards identification

## Classification of the substance or mixture

Gases under pressure: Compressed gas  
Acute toxicity - Category 2, Oral  
Skin corrosion, Sub-category 1B  
Acute toxicity - Category 2, Inhalation

## Label elements

## Pictogram(s)

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Signal word : Danger

## Hazard statement(s)

H225 Highly Flammable liquid and vapour  
H226 Flammable liquid and vapour  
H280 Contains gas under pressure; may explode if heated  
H290 May be corrosive to metals  
H300 Fatal if swallowed

H301 Toxic if swallowed  
H302 Harmful if swallowed  
H304 May be fatal if swallowed and enters airways  
H312 Harmful in contact with skin  
H314 Causes severe skin burns and eye damage  
H318 Causes serious eye damage  
H331 Toxic if inhaled  
H332 Harmful if inhaled  
H335 May cause respiratory irritation  
H336 May cause drowsiness or dizziness  
H351 Suspected of causing cancer  
H360 May damage fertility or the unborn child  
H361 Suspected of damaging fertility or the unborn child  
H370 Causes damage to organs  
H371 May cause damage to organs  
H372 Causes damage to organs through prolonged or repeated exposure  
H373 May cause damage to organs through prolonged or repeated exposure  
H410 Very toxic to aquatic life with long lasting effects  
H411 Toxic to aquatic life with long lasting effects

**Precautionary statement(s)**

P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.  
P233 Keep container tightly closed.  
P234 Keep only in original container.  
P240 Ground/bond container and receiving equipment.  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
P264 Wash hands thoroughly after handling.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P284 Wear respiratory protection.  
P310 Immediately call a POISON CENTER or doctor/physician.  
P314 Get medical advice/attention if you feel unwell.  
P331 Do NOT induce vomiting.  
P390 Absorb spillage to prevent material damage.  
P391 Collect spillage. Hazardous to the aquatic environment  
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.  
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.  
P304+P340 IF INHALED: Remove victim to fresh air and Keep at rest in a position 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.

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P307+P311 IF exposed: call a POISON CENTER or doctor/physician.

P308+P313 IF exposed or concerned: Get medical advice/attention.

P370+P378 In case of fire: Use ... for extinction.

P405 Store locked up.

P406 Store in corrosive resistant/... container with a resistant inner liner.

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

#### **Prevention**

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

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+P316 IF SWALLOWED: Get emergency medical help immediately.

P321 Specific treatment (see ... on this label).

P330 Rinse mouth.

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.

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**

no data available

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## SECTION 3: Composition/information on ingredients

#### **Substance**

Product name : Boron trichloride

Synonyms : BCl<sub>3</sub>, boron trichloride

CAS : 10294-34-5

EC number : 233-658-4  
MF : BCl3  
MW : 117.17

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## SECTION 4: First aid measures

### Description of first aid measures

#### If inhaled

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

#### Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. 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 and effects, both acute and delayed

Strong irritant to tissue. Fumes are corrosive and highly toxic. Boron affects the central nervous system causing depression of circulation as well as shock and coma. May cause severe burns to skin. May result in marked fluid and electrolyte loss and shock. (EPA, 1998)

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

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention.

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## SECTION 5: Firefighting measures

### Extinguishing media

If material involved in fire: Use dry chemical, dry sand, or carbon dioxide. Do not use water on material itself. If large quantities of combustibles are involved, use water in flooding quantities as spray and fog. Use water spray to knock-down vapors. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible.

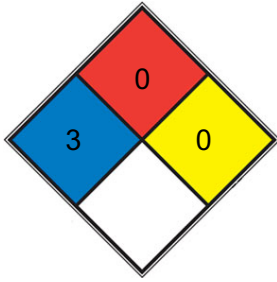
### Specific Hazards Arising from the Chemical

When heated to decomposition, it emits toxic fumes of chlorides. It will react with water or steam to produce heat, and toxic and corrosive fumes. In hot water, decomposes to hydrochloric acid and boric acid. Fumes and hydrolyzes in moist air to form hydrochloric acid and oily, irritating corrosives. Avoid aniline, hexafluoroisopropylidene amino lithium, nitrogen dioxide, phosphine, grease, organic matter, and oxygen. Nitrogen peroxide, phosphine, fat or grease react energetically with boron trichloride. Oxygen and boron trichloride react vigorously on sparking. Boron trichloride and aniline react violently in the absence of a coolant or diluent. Stable. (EPA, 1998)

### Advice for firefighters

NO water. 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.

### NFPA 704



HEALTH 3 Short exposure could cause serious temporary or moderate residual injury (e.g. [liquid hydrogen](#), [sulfuric acid](#), [calcium hypochlorite](#), hexafluorosilicic acid)

FIRE 0 Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 820 °C (1,500 °F) for a period of 5 minutes.(e.g. Carbon tetrachloride)

REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium,[N2](#))

SPEC.

HAZ.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Ventilation. Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus.

### Environmental precautions

Evacuate danger area! Consult an expert! Ventilation. Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus.

### Methods and materials for containment and cleaning up

Evacuate danger area! Consult an expert! Ventilation. (Extra personal protection: gas-tight chemical protection suit including self-contained breathing apparatus).

## 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

Fireproof if in building. Separated from food and feedstuffs. See Chemical Dangers. Fireproof if in building. Separated from food and feedstuffs.

## SECTION 8: Exposure controls/personal protection

### Control parameters

#### Occupational Exposure limit values

TLV: (ceiling value): 0.7 ppm as STEL

#### Biological limit values

no data available

### Exposure 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

#### Eye/face protection

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

#### Skin protection

Cold-insulating gloves. Protective clothing.

#### Respiratory protection

Use ventilation, local exhaust or breathing protection.

#### Thermal hazards

no data available

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## SECTION 9: Physical and chemical properties

### Information on basic physicochemical properties

Physical state	Solution
Colour	White
Odour	Pungent, irritating odor
Melting point/freezing point	-9°C(lit.)
Boiling point or initial boiling point and boiling range	12.5°C(lit.)
Flammability	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit	no data available
Flash point	2°C(lit.)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	1.032 cP at 50 deg F
Solubility	Miscible with dichloromethane, ethanol, carbon tetrachloride, diethyl ether, dimethyl formamide, aromatic solvents, saturated and halogenated hydrocarbon.
Partition coefficient n-octanol/water	no data available

Vapour pressure	29.72 psi ( 55 °C)
Density and/or relative density	0.738
Relative vapour density	4.05 (vs air)
Particle characteristics	no data available

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## SECTION 10: Stability and reactivity

### Reactivity

Decomposes on heating. This produces toxic and corrosive fumes including hydrogen chloride. Reacts violently with water and moist air. This produces hydrogen chloride and boric acid. Reacts violently with aniline, phosphine, alcohols, oxygen and organic matter such as grease. Attacks many metals in the presence of water.

### Chemical stability

Trialkylboranes are stable indefinitely when stored under an inert atmosphere. Trialkylboranes

### Possibility of hazardous reactions

Not flammableThe gas is heavier than air.BORON TRICHLORIDE vigorously attacks elastomers and packing materials. Contact with Viton, Tygon, Saran and natural and synthetic rubbers is not recommended. Highly corrosive to most metals in the presence of moisture. Reacts energetically with nitrogen dioxide/dinitrogen tetroxide, aniline, phosphine, triethylsilane, or fat and grease [Mellor 5:132 1946-47]. Reacts exothermically with chemical bases (examples: amines, amides, inorganic hydroxides).

### Conditions to avoid

no data available

### Incompatible materials

Boron trichloride reacts energetically with nitrogen peroxide, phosphine, or fat and grease.

### Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /hydrogens of chloride/.

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## SECTION 11: Toxicological information

### Acute toxicity

- Oral: no data available
- Inhalation: LC50 Rat (male) inhalation 2,541 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 this gas may cause lung oedema. See Notes. Rapid evaporation of the liquid may cause frostbite. Exposure at high levels could cause death. The effects may be delayed. Medical observation is indicated.

#### **STOT-repeated exposure**

no data available

#### **Aspiration hazard**

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

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## SECTION 12: Ecological information

### **Toxicity**

Toxicity to fish: no data available

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

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## 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.

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## SECTION 14: Transport information

### UN Number

ADR/RID: UN1741 (For reference only, please check.)

IMDG: UN1741 (For reference only, please check.)

IATA: UN1741 (For reference only, please check.)

### UN Proper Shipping Name

ADR/RID: BORON TRICHLORIDE (For reference only, please check.)

IMDG: BORON TRICHLORIDE (For reference only, please check.)

IATA: BORON TRICHLORIDE (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

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## 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.

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## 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](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**

Reacts violently with fire extinguishing agents such as water. 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 is therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorized by him/her, should be considered.

#### **Disclaimer:**

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.