

1. Identification

Product identifier	Trona® Boron Trichloride
Other means of identification	
SDS number	B-5001
Product code	Boron Trichloride
Recommended use	Chemical intermediate.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Company name	Tronox LLC
Address	3301 NW 150th Street Oklahoma City, OK 73134 USA
Email	ChemProdSteward@tronox.com
Telephone	+1-405-775-5000 (24-hours)
Emergency telephone number	+1-877-358-7421 +1-760-476-3962 (Access code: 333318)

2. Hazard(s) identification

Physical hazards	Gases under pressure	Compressed gas
Health hazards	Acute toxicity, oral	Category 2
	Acute toxicity, inhalation	Category 2
	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
OSHA defined hazards	Not classified.	

Label elements



Signal word	Danger
Hazard statement	Contains gas under pressure; may explode if heated. Fatal if swallowed. Fatal if inhaled. Causes severe skin burns and eye damage. May cause respiratory irritation.
Precautionary statement	
Prevention	Do not eat, drink or smoke when using this product. Do not breathe gas. Use only outdoors or in a well-ventilated area. Wear respiratory protection. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling.
Response	If swallowed: Immediately call a poison center/doctor. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Storage	Store in a well-ventilated place. Keep container tightly closed.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	Reacts violently with water.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Boron trichloride		10294-34-5	99.95

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation

Move injured person into fresh air and keep person calm under observation. For breathing difficulties, oxygen may be necessary. Get medical attention immediately. If breathing stops, provide artificial respiration.

Skin contact

Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Frostbite: Do not remove clothes, but flush with copious amounts of lukewarm water. Call an ambulance and continue to flush during transportation to hospital.

Eye contact

Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes. If frostbite occurs, immediately flush eyes with plenty of warm water (not exceeding 105°F/41°C) for at least 15 minutes. If easy to do, remove contact lenses.

Ingestion

This material is a gas under normal atmospheric conditions and ingestion is unlikely. If ingestion occurs: Call a physician or poison control center immediately. DO NOT induce vomiting. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than the hips to help prevent aspiration.

Most important symptoms/effects, acute and delayed

Contact with this material will cause burns to the skin, eyes and mucous membranes. Cough, shortness of breath, headache, nausea, vomiting. Swallowing may cause nausea; vomiting or diarrhea of blue-green materials are common and may be accompanied by dark blood.

Indication of immediate medical attention and special treatment needed

Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure. Inhalation may result in delayed onset of dyspnea, chest pain, and pulmonary edema. Be alert to kidney involvement due to boron toxicity and concentration effects during excretion.

5. Fire-fighting measures

Suitable extinguishing media

Carbon dioxide or dry powder.

Unsuitable extinguishing media

Reacts with water. Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical

Hydrogen chloride gas. Chlorine. Boron oxides.

Special protective equipment and precautions for firefighters

In case of contact with water used for fire extinguishing, use chemical resistant protective suit.

Fire fighting equipment/instructions

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Move containers from fire area if you can do so without risk. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Specific methods

Evacuate area. Cool containers exposed to flames with water until well after the fire is out. Do not get water inside container. Remove pressurized gas cylinders from the immediate vicinity. Close the valve if no risk is involved. Do not extinguish a leaking gas fire unless leak can be stopped. If leak cannot be stopped and no danger to surrounding area allow the fire to burn out. Fight fire from a protected location.

General fire hazards

Containers can burst violently when heated, due to excess pressure build-up.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

If leakage cannot be stopped, evacuate area. Stay upwind. Ventilate closed spaces before entering. DO NOT touch spilled material. Avoid contact with cold gas. Avoid inhalation and contact with skin and eyes. In aqueous solution: Avoid contact with spilled material. Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area. See Section 8 of the SDS for Personal Protective Equipment.

Methods and materials for containment and cleaning up Ventilate well, stop flow of gas or liquid if possible. Prevent entry into waterways, sewers, basements or confined areas. Use water spray to reduce vapors or divert vapor cloud drift. Do not put water directly on leak, spill area or inside container. Allow gas to dissipate into the atmosphere. Vapor can be controlled using a water fog. Water used for control of vapor may become corrosive or toxic and should be contained properly for later disposal.

Small Spills: In aqueous solution: Absorb spillage with non-combustible, absorbent material. Shovel up and place in a non-metal waste container for later disposal. Neutralize spill area and wash with plenty of water.

Large Spills: Dike flow of spilled material using soil or sandbags. Isolate area until gas has dispersed.

Environmental precautions Stop leak if possible without any risk. Sewers must be covered and basements and workpits evacuated. Avoid release to the environment. Local authorities should be advised if significant releases cannot be contained.

7. Handling and storage

Precautions for safe handling Use only with adequate ventilation. Avoid any exposure. Open valve slowly. Secure that cylinders are not exposed to heat. Immediately change contaminated clothes. When using, do not eat, drink or smoke. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat and flame. Wear approved safety goggles. Wear protective gloves and appropriate clothing to prevent skin contact. See Section 8 of the SDS for Personal Protective Equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities Compressed gas storage. Store in a cool and well-ventilated place. Secure cylinders from falling or being knocked over.

8. Exposure controls/personal protection

Occupational exposure limits No exposure limits noted for ingredient(s).

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines No exposure standards allocated.

Appropriate engineering controls Provide adequate general and local exhaust ventilation. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear approved chemical safety goggles. Gas-proof goggles are recommended.

Skin protection

Hand protection Risk of contact: Wear cold insulating gloves. Suitable gloves can be recommended by the glove supplier.

Other Wear appropriate chemical resistant clothing to prevent any possibility of skin contact.

Respiratory protection If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection. Wear suitable respiratory protection. Respirator type: Chemical respirator with specific cartridge and full facepiece providing protection against the compound of concern. Seek advice from local supervisor.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practice. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance Compressed liquefied gas.

Physical state Gas.

Form Compressed gas.

Color Clear.

Odor Pungent.

Odor threshold Not available.

pH Not applicable.

Melting point/freezing point -161.14 °F (-107.3 °C) at 101.325 kPa

Initial boiling point and boiling range 54.32 °F (12.4 °C) at 101.325 kPa

Flash point Not available.

Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	131.7 kPa at 21.1 °C
Vapor density	Not available.
Relative density	4.12 (32 °F (0 °C))
Solubility(ies)	
Solubility (water)	Decomposes in contact with water.
Partition coefficient (n-octanol/water)	Not applicable. Not applicable.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Bulk density	89 lb/ft ³
Density	1.37 g/cm ³
Dynamic viscosity	0.01 mPa.s
Molecular formula	B-Cl ₃
Molecular weight	117.19 g/mol

10. Stability and reactivity

Reactivity	Reacts with water.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Reacts vigorously with water, liberating heat and forming hydrochloric acid and boric acid. Reacts with moist air, producing hydrochloric acid fumes and boric acid.
Conditions to avoid	Heat, sparks, flames, elevated temperatures. Do not allow water to get into container because of violent heat release reaction.
Incompatible materials	Because of its tendency to form hydrochloric acid, the material should be kept away from: Alcohols. Alkalis. Amines. Fats, grease. Organic material. Strong oxidizing agents. Water.
Hazardous decomposition products	Hydrogen chloride gas. Chlorine. Boron oxides.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Fatal if inhaled. Can cause severe respiratory irritation. May cause lung edema.
Skin contact	May cause serious chemical burns to the skin.
Eye contact	Causes severe eye burns. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.
Ingestion	Fatal if swallowed. This material is a gas under normal atmospheric conditions and ingestion is unlikely. However: Causes digestive tract burns.

Symptoms related to the physical, chemical and toxicological characteristics Contact with this material will cause burns to the skin, eyes and mucous membranes. Cough, shortness of breath, headache, nausea, vomiting. Swallowing may cause nausea; vomiting or diarrhea of blue-green materials are common and may be accompanied by dark blood.

Information on toxicological effects

Acute toxicity Fatal if inhaled. Fatal if swallowed. Causes skin, eye and digestive tract burns. Causes severe respiratory tract irritation.

Product	Species	Test Results
Boron trichloride (CAS 10294-34-5)		
Acute		
<i>Inhalation</i>		
LC50	Rat	2541 ppm, 1 Hours
Skin corrosion/irritation	Causes skin burns.	
Serious eye damage/eye irritation	Causes severe eye burns.	
Respiratory or skin sensitization		
Respiratory sensitization	Based on available data, the classification criteria are not met.	
Skin sensitization	Not a skin sensitizer.	
Germ cell mutagenicity	Based on available data, the classification criteria are not met.	
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.	
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)		
Not listed.		
Reproductive toxicity	Boron: High doses have demonstrated effects on fertility, testes, and developmental effects on the fetus in laboratory animals. Relevance of these findings to humans is uncertain.	
Specific target organ toxicity - single exposure	May cause respiratory tract irritation.	
Specific target organ toxicity - repeated exposure	Based on available data, the classification criteria are not met.	
Aspiration hazard	Not applicable.	
Chronic effects	May cause damage to the kidneys.	
Further information	Be aware that symptoms of lung edema (shortness of breath) may develop up to 24 hours after exposure. May cause damage to the kidneys.	

12. Ecological information

Ecotoxicity	In aqueous solution: Substantial amounts of the product may lead to a local change in acidity in small water systems which may have adverse effects on aquatic organisms.
Persistence and degradability	Expected to degrade rapidly in water due to hydrolysis.
Bioaccumulative potential	The product is not expected to bioaccumulate.
Mobility in soil	Not available.
Mobility in general	The product reacts with water and will generate heat.
Other adverse effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. Disposal considerations

Disposal instructions	The packaging should be collected for reuse. Dispose of this material and its container to hazardous or special waste collection point. Dispose in accordance with all applicable regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	D003: Waste Reactive material
Waste from residues / unused products	Dispose in accordance with applicable federal, state, and local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1741
UN proper shipping name	Boron trichloride
Transport hazard class(es)	
Class	2.3
Subsidiary risk	8
Label(s)	2.3, 8
Packing group	Not applicable.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Special provisions 3, B9, B14
Packaging exceptions None
Packaging non bulk 304
Packaging bulk 314

DOT BULK

BULK

UN number UN1741
UN proper shipping name Boron trichloride
Transport hazard class(es)
Class 2.3
Subsidiary risk 8
Label(s) 2.3, 8
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Special provisions 3, B9, B14
Packaging exceptions None
Packaging non bulk 304
Packaging bulk 314

IATA

UN number UN1741
UN proper shipping name Boron trichloride
Transport hazard class(es)
Class 2.3
Subsidiary risk 8
Label(s) 2.3, 8
Packing group Not applicable.
Environmental hazards No.
ERG Code 2CP
Special precautions for user Passenger and Cargo Aircraft Quantity limitation: Forbidden.

IMDG

UN number UN1741
UN proper shipping name BORON TRICHLORIDE
Transport hazard class(es)
Class 2.3
Subsidiary risk 8
Label(s) 2.3, 8
Packing group Not applicable.
Environmental hazards
Marine pollutant No.
EmS F-C, S-U

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable. This product is a compressed or liquefied gas and when transported in bulk is covered under IGC code.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
 Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - No
 Pressure Hazard - Yes
 Reactivity Hazard - Yes

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
Boron trichloride	10294-34-5	500	500		

SARA 311/312 Hazardous chemical

Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Boron trichloride	10294-34-5	99.95

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Boron trichloride (CAS 10294-34-5)

Safe Drinking Water Act (SDWA)

Not regulated.

US state regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Boron trichloride (CAS 10294-34-5)

US. New Jersey Worker and Community Right-to-Know Act

Boron trichloride (CAS 10294-34-5)

US. Pennsylvania Worker and Community Right-to-Know Law

Boron trichloride (CAS 10294-34-5)

US. Rhode Island RTK

Boron trichloride (CAS 10294-34-5)

US. California Proposition 65

Not Listed.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision**Issue date** 09-February-2015

Revision date 20-April-2015
Version # 03
HMIS® ratings Health: 4
Flammability: 0
Physical hazard: 3
Personal protection: X

NFPA ratings



References

IARC Monographs. Overall Evaluation of Carcinogenicity (Volumes 1-106)
Chemical safety report.

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.