

BORON TRICHLORIDE

BRT

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Boron chloride	Liquid Colorless Irritating odor Reacts violently with water. Irritating visible vapor cloud is produced. Boiling point is 54°F.
<p>Restrict access. Evacuate. AVOID CONTACT WITH LIQUID AND VAPOR. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Notify local health and pollution control agencies. Protect water intakes.</p>	
Fire	Not flammable. POISONOUS GASES MAY BE PRODUCED WHEN HEATED. Cool exposed containers with water.
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled will cause coughing or difficult breathing. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID POISONOUS IF SWALLOWED. Will burn skin and eyes. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.
Water Pollution	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Chemical and Physical Treatment:
Neutralize
Do not add water to undissolved material

2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** Not listed.
2.2 **Formula:** BCl₃
2.3 **IMO/UN Designation:** 2/1741
2.4 **DOT ID No.:** 1741
2.5 **CAS Registry No.:** 10294-34-5
2.6 **NAERG Guide No.:** 125
2.7 **Standard Industrial Trade Classification:** 52329

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Chemical goggles; rubber protective clothing and gloves; self-contained breathing apparatus.
- 3.2 **Symptoms Following Exposure:** Inhalation causes edema and severe irritation of the upper respiratory system. Contact with liquid causes acid burns of eyes and severe burns of skin. Ingestion causes severe burns of mouth and stomach.
- 3.3 **Treatment of Exposure:** INHALATION: remove to fresh air; give oxygen or apply artificial respiration; keep warm; call a doctor at once; observe for pulmonary edema. EYES: wash with plenty of water for 15 min.; consult an eye specialist. SKIN: wash off with plenty of water. INGESTION: do NOT induce vomiting; give large amount of water.
- 3.4 **TLV-TWA:** Not listed.
3.5 **TLV-STEL:** Not listed.
3.6 **TLV-Ceiling:** Not listed.
3.7 **Toxicity by Ingestion:** Grade 2; LD₅₀ = 0.5 to 5 g/kg
3.8 **Toxicity by Inhalation:** Currently not available.
3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Vapors cause severe irritation of eyes and throat and can cause eye or lung injury. They cannot be tolerated even at low concentrations.
- 3.11 **Liquid or Solid Characteristics:** Severe skin irritant. Causes second- and third-degree burns on short contact and is very injurious to the eyes.
- 3.12 **Odor Threshold:** Decomposes in moist air, releasing hydrochloric acid and decomposition products. Hydrochloric acid - 1 ppm
- 3.13 **IDLH Value:** Not listed.
3.14 **OSHA PEL-TWA:** Not listed.
3.15 **OSHA PEL-STEL:** Not listed.
3.16 **OSHA PEL-Ceiling:** Not listed.
3.17 **EPA AEGL:** Not listed

4. FIRE HAZARDS

- 4.1 **Flash Point:** Not flammable
4.2 **Flammable Limits in Air:** Not flammable
4.3 **Fire Extinguishing Agents:** Not pertinent
4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent
4.5 **Special Hazards of Combustion Products:** Not pertinent
4.6 **Behavior in Fire:** Toxic fumes of hydrogen chloride are given off upon contact with water applied to adjacent fires.
4.7 **Auto Ignition Temperature:** Not pertinent
4.8 **Electrical Hazards:** Not pertinent
4.9 **Burning Rate:** Not pertinent
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent
4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Reacts vigorously to liberate heat and forms hydrogen chloride fumes (hydrochloric acid) and boric acid.
5.2 **Reactivity with Common Materials:** Vigorously attacks elastomers and packing materials. Viton, Tygon, Saran, or silastic elastomers and natural and synthetic rubbers are not recommended for service. Lead and graphite-impregnated asbestos are to be avoided. In the presence of moisture, highly corrosive to most metals.
5.3 **Stability During Transport:** Stable
5.4 **Neutralizing Agents for Acids and Caustics:** Flush with water, rinse with sodium bicarbonate or lime solution.
5.5 **Polymerization:** Not pertinent
5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** Currently not available
6.2 **Waterfowl Toxicity:** Currently not available
6.3 **Biological Oxygen Demand (BOD):** None
6.4 **Food Chain Concentration Potential:** None
6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** C.P. (99.9+%)
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Pressure-vacuum
7.5 **IMO Pollution Category:** Currently not available
7.6 **Ship Type:** Currently not available
7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Poison gas
8.2 **49 CFR Class:** 2.3
8.3 **49 CFR Package Group:** Not listed.
8.4 **Marine Pollutant:** No
8.5 **NFPA Hazard Classification:** Not listed
8.6 **EPA Reportable Quantity:** Not listed.
8.7 **EPA Pollution Category:** Not listed.
8.8 **RCRA Waste Number:** Not listed
8.9 **EPA FWPCA List:** Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Gas
21.60 X 10³ J/kg
9.2 **Molecular Weight:** 117.2
9.3 **Boiling Point at 1 atm:** 54.3°F = 12.4°C = 285.6°K
9.4 **Freezing Point:** -161°F = -107°C = 166°K
9.5 **Critical Temperature:** 352.4°F = 178°C = 451.2°K
9.6 **Critical Pressure:** 566 psia = 38.5 atm = 3.90 MN/m²
9.7 **Specific Gravity:** 1.35 at 11°C (liquid)
9.8 **Liquid Surface Tension:** 16.7 dynes/cm = 0.0167 N/m at 20°C
9.9 **Liquid Water Interfacial Tension:** Not pertinent
9.10 **Vapor (Gas) Specific Gravity:** 4
9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.1470
9.12 **Latent Heat of Vaporization:** 68.8 Btu/lb = 38.2 cal/g =
9.13 **Heat of Combustion:** Not pertinent
9.14 **Heat of Decomposition:** Not pertinent
9.15 **Heat of Solution:** -13,000 Btu/lb = -7,200 cal/g = -300 X 10³ J/kg
9.16 **Heat of Polymerization:** Not pertinent
9.17 **Heat of Fusion:** 4.3 cal/g
9.18 **Limiting Value:** Currently not available
9.19 **Reid Vapor Pressure:** Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
34	88.759	34	0.214	-35	0.816	0	1.509
36	88.250	36	0.214	-30	0.811	5	1.448
38	87.750	38	0.215	-25	0.806	10	1.390
40	87.240	40	0.215	-20	0.801	15	1.335
42	86.730	42	0.215	-15	0.796	20	1.284
44	86.230	44	0.216	-10	0.791	25	1.236
46	85.719	46	0.216	-5	0.786	30	1.190
48	85.209	48	0.216	0	0.781	35	1.147
50	84.710	50	0.216	5	0.776	40	1.107
52	84.200	52	0.217	10	0.771	45	1.068
54	83.690	54	0.217	15	0.767	50	1.032
				20	0.762		
				25	0.757		
				30	0.752		
				35	0.747		
				40	0.742		
				45	0.737		
				50	0.732		

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	R	-35	1.499	-35	0.03855	100	0.133
	E	-30	1.746	-30	0.04437	120	0.134
	A	-25	2.027	-25	0.05090	140	0.135
	C	-20	2.344	-20	0.05821	160	0.136
	T	-15	2.702	-15	0.06635	180	0.136
	S	-10	3.105	-10	0.07540	200	0.137
		-5	3.558	-5	0.08543	220	0.138
		0	4.064	0	0.09652	240	0.139
		5	4.629	5	0.10880	260	0.139
		10	5.258	10	0.12220	280	0.140
		15	5.956	15	0.13700	300	0.141
		20	6.729	20	0.15320	320	0.142
		25	7.584	25	0.17080	340	0.142
		30	8.527	30	0.19010	360	0.143
		35	9.564	35	0.21110	380	0.144
		40	10.700	40	0.23380	400	0.145
		45	11.950	45	0.25850	420	0.145
		50	13.310	50	0.28520	440	0.146
		55	14.800	55	0.31400	460	0.147
						480	0.148
						500	0.148
						520	0.149
						540	0.150
						560	0.151
						580	0.152
						600	0.152