

BORON TRIBROMIDE

BTB

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Liquid Colorless Sharp odor
	Reacts violently with water. Poisonous vapor is produced.
	<p>Restrict access. Evacuate. Avoid contact with liquid and vapor. Notify local health and pollution control agencies. Protect water intakes.</p>
Fire	<p>Not flammable. POISONOUS GASES MAY BE PRODUCED IN FIRE. Wear goggles and self-contained breathing apparatus. DO NOT USE WATER ON ADJACENT FIRES.</p>
Exposure	<p>CALL FOR MEDICAL AID.</p> <p>VAPOR Irritating to eyes, nose and throat. If inhaled will cause coughing or difficult breathing. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID Will burn skin and eyes. If swallowed will cause nausea and vomiting. 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. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.</p>
Water Pollution	<p>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.</p>

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: BBr₃
- 2.3 IMO/UN Designation: Not listed
- 2.4 DOT ID No.: 2892
- 2.5 CAS Registry No.: 10294-33-4
- 2.6 NAERG Guide No.: 157
- 2.7 Standard Industrial Trade Classification: 52329

3. HEALTH HAZARDS

- 3.1 Personal Protective Equipment: Chemical safety glasses or face mask, rubber gloves, and respiratory protection
- 3.2 Symptoms Following Exposure: Inhalation causes severe irritation of mucous membranes. Ingestion causes burns of mouth and stomach. Contact with eyes or skin causes severe burns.
- 3.3 Treatment of Exposure: Get medical attention for all exposures to this chemical. INHALATION: remove from exposure; support respiration. INGESTION: give large amounts of water. EYES: flush with water for at least 15 min. SKIN: wash thoroughly with water; launder clothing before reuse.
- 3.4 TLV-TWA: Not listed.
- 3.5 TLV-STEL: Not listed.
- 3.6 TLV-Ceiling: 1 ppm.
- 3.7 Toxicity by Ingestion: Currently not available
- 3.8 Toxicity by Inhalation: Currently not available.
- 3.9 Chronic Toxicity: Currently not available
- 3.10 Vapor (Gas) Irritant Characteristics: Currently not available
- 3.11 Liquid or Solid Characteristics: Currently not available
- 3.12 Odor Threshold: Currently not available
- 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: Do not use water or foam on adjacent fires.
- 4.5 Special Hazards of Combustion Products: Toxic fumes of the chemical or hydrogen bromide may form in fires.
- 4.6 Behavior in Fire: Currently not available
- 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 violently to form hydrobromic acid solution and fumes.
- 5.2 Reactivity with Common Materials: Strongly attacks metals and wood. Flammable hydrogen gas may collect in enclosed spaces.
- 5.3 Stability During Transport: Stable
- 5.4 Neutralizing Agents for Acids and Caustics: Flush with water, rinse with dilute solution of sodium bicarbonate or soda ash.
- 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: Epitaxial, 99.999+%; Pure, 99.99+%; Technical
- 7.2 Storage Temperature: Ambient
- 7.3 Inert Atmosphere: Padded
- 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: Corrosive material
- 8.2 49 CFR Class: 8
- 8.3 49 CFR Package Group: I
- 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: Liquid
- 9.2 Molecular Weight: 250.5
- 9.3 Boiling Point at 1 atm: 196°F = 91°C = 364°K
- 9.4 Freezing Point: -51°F = -46°C = 227°K
- 9.5 Critical Temperature: Not pertinent
- 9.6 Critical Pressure: Not pertinent
- 9.7 Specific Gravity: 2.645 at 20°C (liquid)
- 9.8 Liquid Surface Tension: 29.1 dynes/cm = 0.0291 N/m at 22°C
- 9.9 Liquid Water Interfacial Tension: Not pertinent
- 9.10 Vapor (Gas) Specific Gravity: 8.64
- 9.11 Ratio of Specific Heats of Vapor (Gas): 1.140
- 9.12 Latent Heat of Vaporization: 52 Btu/lb = 29 cal/g = 1.2 X 10 J/kg
- 9.13 Heat of Combustion: Not pertinent
- 9.14 Heat of Decomposition: Not pertinent
- 9.15 Heat of Solution: Currently not available
- 9.16 Heat of Polymerization: Not pertinent
- 9.17 Heat of Fusion: 2.9 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
10	170.799		N		N	40	0.876
15	170.299		O		O	45	0.852
20	169.799		T		T	50	0.830
25	169.299					55	0.808
30	168.799		P		P	60	0.787
35	168.299		E		E	65	0.768
40	167.699		R		R	70	0.749
45	167.199		T		T	75	0.731
50	166.699		I		I	80	0.714
55	166.199		N		N	85	0.697
60	165.699		E		E	90	0.681
65	165.199		N		N	95	0.666
70	164.599		T		T	100	0.651
75	164.099					105	0.637
80	163.599					110	0.624
85	163.099					115	0.611
90	162.599					120	0.598
95	162.099					125	0.586
100	161.599					130	0.575
105	161.000					135	0.563
110	160.500					140	0.553
115	160.000					145	0.542
120	159.500					150	0.532
125	159.000					155	0.522
130	158.500					160	0.513
135	157.900					165	0.504

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	40	0.472	40	0.02202	85	0.065
	E	45	0.548	45	0.02536	90	0.065
	A	50	0.635	50	0.02909	95	0.065
	C	55	0.734	55	0.03327	100	0.065
	T	60	0.844	60	0.03792	105	0.065
	S	65	0.969	65	0.04310	110	0.065
		70	1.108	70	0.04884	115	0.065
		75	1.264	75	0.05518	120	0.065
		80	1.438	80	0.06218	125	0.065
		85	1.631	85	0.06987	130	0.065
		90	1.845	90	0.07832	135	0.065
		95	2.081	95	0.08757	140	0.065
		100	2.342	100	0.09767	145	0.065
		105	2.630	105	0.10870	150	0.065
		110	2.946	110	0.12070	155	0.065
		115	3.292	115	0.13370	160	0.065
		120	3.671	120	0.14780	165	0.065
		125	4.084	125	0.16300	170	0.065
		130	4.535	130	0.17950		
		135	5.025	135	0.19720		
		140	5.557	140	0.21630		
		145	6.134	145	0.23670		
		150	6.758	150	0.25870		
		155	7.432	155	0.28220		
		160	8.159	160	0.30730		
		165	8.943	165	0.33410		