

**BORON TRIFLUORIDE****TOXIC BY INHALATION.****Physical Properties:**

Colorless, fuming gas with pungent suffocating odor; bp -100.4°C.<sup>1,2</sup>

**Chemical Properties:**

Soluble in water with some decomposition forming fluoroboric and boric acids; somewhat soluble in concentrated sulfuric acid and nitric acid; soluble in benzene, dichlorobenzene, chloroform, carbon tetrachloride and carbon disulfide.<sup>1,2</sup>

**Hazardous Reactions:**

Alkali Metals or Alkaline Earth Metals (Not Magnesium). Interaction without cooling causes incandescence.<sup>2</sup>

**Physiological Properties and Health Hazards:**

The gas irritates the skin, eyes and respiratory system; at high concentrations it may burn the skin.

Prevent inhalation of gas. Prevent contact with skin and eyes.<sup>2</sup> OEL (max) 1 ppm (2.8 mg/m<sup>3</sup>).<sup>3</sup> TLV 1 ppm.

**Waste Disposal:**

Seal cylinder and return to supplier. In the fume hood, surplus gas or leaking cylinder can be slowly added to a flask containing water. Precipitate the fluoride in solution by adding calcium chloride solution (10%). Let stand overnight. Filter off the precipitate and send to a landfill. Flush the filtrate down the drain with at least 50 times its volume of water.<sup>4</sup>

**BORON TRIFLUORIDE COMPLEXES**

The liquid complex formed between boron trifluoride and acetic acid, diethyl ether, methanol and propanol all display hazards and toxic effects associated with their constituents. All are readily hydrolyzed by water, corrosive and, to some degree, flammable.<sup>2</sup>

**Spillage Disposal:**

Wear nitrile rubber gloves, laboratory coat, eye protection and, if necessary, a self-contained breathing apparatus. Cover the spill with a 1:1:1 mixture by weight of sodium carbonate or calcium carbonate, clay cat litter (bentonite)

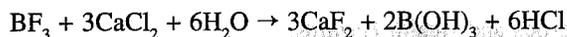
and sand. When the boron trifluoride complex has been absorbed, scoop the mixture into a plastic pail and, in the fume hood, very slowly add the mixture to a pail of cold water. Allow to stand 24 h. Test the pH of the solution and neutralize if necessary with sodium carbonate. Decant the solution to the drain flushing with 50 times its volume of water. Treat the solid residue as normal refuse.<sup>5</sup>

#### Waste Disposal:

**Package Lots.** Place in a separate labeled container for recycling or disposal.

**Small Quantities.** Wear nitrile rubber gloves, laboratory coat and eye protection. In the fume hood, pour the boron trifluoride complex into a large evaporating dish. Cover the boron trifluoride complex with excess solid sodium carbonate or calcium carbonate. When the reaction has subsided, very slowly add the mixture to a pail of cold water. Allow to stand 24 hours. Test the pH of the solution and neutralize if necessary. Pour the solution to the drain flushing with at least 50 times its volume of water.<sup>2-5</sup>

#### Reactions for Spillage and Waste Disposal:



calcium boric  
fluoride acid  
(insoluble)

#### References

1. Merck 1335.
2. Be 202; ITI 090.
3. CHR.
4. PP 86.
5. Armour, M. A., Browne, L. M., Weir, G. L., unpublished results.

# Hazardous Laboratory Chemicals Disposal Guide

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