

Material Safety Data Sheet Boric Oxide

1. IDENTIFICATION OF THE SUBSTANCE

Product Name: Boric Oxide

Synonyms: anhydrous boric acid, boron trioxide, diboron trioxide

CAS No.: 1303-86-2

Molecular Weight: 69.6

Chemical Formula: B₂O₃

2. HAZARDS IDENTIFICATION

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS

Health Rating: 2 - Moderate

Flammability Rating: 0 - None

Reactivity Rating: 0 - None

Contact Rating: 2 - Moderate

Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Inhalation: Causes irritation to the mucous membranes of the respiratory tract. May be absorbed from the mucous membranes, and depending on the amount of exposure could result in the development of nausea, vomiting, diarrhea, drowsiness, rash, headache, fall in body temperature, low blood pressure, renal injury, cyanosis, coma, and death.

Ingestion: Not intended for ingestion, boric oxide has low acute toxicity. Small amounts (e.g. a teaspoon) swallowed accidentally are not likely to cause harmful effects; larger amounts may cause gastrointestinal symptoms.

Skin Contact: Boric Oxide is poorly absorbed through intact skin and therefore not likely to cause irritation.

Eye Contact: Non-irritating to eyes in normal industrial use.

Cancer: Not a known carcinogen

3. FIRST AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: Amounts less than one teaspoon require no action if no symptoms occur, give two glasses of water and seek medical attention for larger amounts ingested.

Skin Contact: Non-irritating. Remove clothing.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if symptoms persist for more than 30 minutes.

4. FIRE-FIGHTING MEASURES

Fire: Not considered to be a fire hazard.

Fire Extinguishing Media: Use any means suitable for extinguishing surrounding fire.

5. ACCIDENTAL RELEASE MEASURES

Boric Oxide is a water-soluble white powder that may, at high concentrations, cause damage to trees or vegetation through root absorption. Vacuum, shovel, or sweep up spills and place in containers for disposal according to local regulations.

6. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation System: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved): If the exposure limit is exceeded and engineering controls are not feasible, a half face piece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerin, etc.) are present, use a NIOSH type R or P filter.

Skin Protection: Gloves and lab coat, apron or coveralls.

Eye Protection: Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White powder or granules.

Odor: Odorless.

Solubility: 4.0% @ 20° C.

Density: 1.51

pH: 5.1 Aqueous solution: (1.0% solution)

Melting Point: 450-465°C (842-869°F)

Vapor Pressure (mm Hg): negligible @ 20C (68°F)

8. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage. If moisture is present, boric oxide can be corrosive to iron.

Hazardous Decomposition Products: none

Incompatibilities: Reaction with strong reducing agents, such as metal hydrides or alkali metals, will generate hydrogen gas, which could create an explosion hazard.

Conditions to Avoid: No information found.

Toxicological Information

9. TOXICOLOGICAL INFORMATION

Oral rat LD50: 1970-2100 mg/kg

Reproductive Toxicity: Animal feeding studies in rats, mice, and dogs at high doses have demonstrated effects on fertility and testes.

NTP Carcinogen

Ingredient	Known	Anticipated
Boric Oxide (1303-86-2)	No	No

10. ECOLOGICAL INFORMATION

Environmental Fate: No information found.

Environmental Toxicity: Boron (B) is the element in boric oxide, which is used by convention to report borate product ecological effects. It occurs naturally in the environment including in seawater at an average concentration of 5 mg B/L, and freshwater at 1 mg B/L. In dilute solutions the predominant boron species is undissociated boric acid. To convert boric oxide into the equivalent boron content, multiply by 0.3105.

Phytotoxicity: Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in high quantities.

Persistence/Degradation: Boron is naturally occurring and ubiquitous in the environment. Boric oxide decomposes in the environment to natural borates.

Soil Mobility: Boric Oxide is soluble in water and is leachable through normal soil.

11. TRANSPORT INFORMATION

DOT Hazardous Classification: boric oxide is not regulated by the US DOT and is therefore not considered a hazardous material

TDG Canadian Transportation: Boric Oxide is not regulated under the Transportation of Dangerous Goods.



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