

BORIC OXIDE**PRODUCT IDENTIFICATION****Chemical Name and Synonyms:**

Boric oxide; Boric anhydride; Boron trioxide; Diboron trioxide;
Fused boric acid

Chemical Family:

Inorganic oxide

Chemical Formula:

B₂O₃

Product Use:

Laboratory reagent

Manufacturer's Name and Address:

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HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients	%	TLV Units	CAS No.
Boric oxide	~98	10 mg/m ³	1303-86-2

PHYSICAL DATA**Physical State:**

Solid

Odour and Appearance:

Colourless or white powder or lumps; odourless

Odour Threshold (ppm):

Not applicable

Vapour Pressure (mm Hg):

~0

Vapour Density (Air = 1):

Not applicable

Evaporation Rate:

Not applicable

Boiling Point (degrees C):

1860°C

Melting Point (degrees C):

Indeterminate (loses water in stages through metaboric acid)

pH:

Not applicable

Specific Gravity:

1.4347 @ 15°C

Coefficient of Water/Oil distribution:

Not applicable

SHIPPING DESCRIPTION**UN:**

Not regulated

T.D.G. Class:

Not regulated

Pkg. Group:

Not regulated

REACTIVITY DATA**Chemical Stability:**

Stable. Hygroscopic.

Incompatibility with other substances:

Potassium, bromine pentafluoride, acids.. A mixture with calcium oxide, added to calcium chloride, incandescens.

Reactivity:

Avoid exposure to moisture, all incompatible materials, generation of dust.

Hazardous Decomposition Products:

None known

FIRE AND EXPLOSION DATA**Flammability:**

Non combustible. Will not burn.

Extinguishing Media:

Use extinguisher appropriate to surrounding fire. Product is inherent fire retardant. Use water as a spray or fog to disperse fumes. Firefighters must wear protective equipment (positive-pressure, full face-piece self-contained breathing apparatus) and clothing sufficient to prevent inhalation of dust or fumes and contact with skin and eyes.

Flash Point (Method Used):

Not applicable

Autoignition Temperature:

Not applicable

Upper Flammable Limit (% by volume):

Not applicable

Lower Flammable Limit (% by volume):

Not applicable

Hazardous Combustion Products:

May release toxic or irritating fumes

Sensitivity to Impact:

None

Sensitivity to Static discharge:

None

TOXICOLOGICAL PROPERTIES AND HEALTH DATA**Toxicological Data:****LD₅₀:**

(oral, mouse) 3,136 mg/kg

LC₅₀:

Not available

Effects of Acute Exposure to Product:

To the best of our knowledge, the physical, chemical and toxicological properties of this substance have not yet been thoroughly investigated. Animal experiments indicate that the toxicity of this compound is relatively low. However, boron compounds, particularly boric acid or borates, have caused poisoning, with persistent vomiting and diarrhea, depressed circulation, skin rash, eventual shock and coma.

Inhaled:

Harmful, may irritate nasal and respiratory passages on contact. High concentrations of dust may cause coughing, nosebleeds, shortness of breath. If exposure is severe, or prolonged, can be absorbed causing systemic effects, with persistent vomiting and diarrhea, depressed circulation, skin rash and respiratory ill health, eventual shock and coma.

In contact with skin:

Irritates. May be absorbed through broken skin, not through intact skin. Absorption of large amounts may cause systemic effects, see above.

In contact with eyes:

May cause slight reversible conjunctivitis.

Ingested:

Irritating to gastrointestinal tract. May cause nausea, vomiting, diarrhea, abdominal cramps. Large doses may cause circulatory collapse, tachycardia, cyanosis, delirium, convulsions and coma. Death has been reported to occur in adults from doses of 5 to 20 grams.

BORIC OXIDE

Effects of Chronic Exposure to Product:

Carcinogenicity:

No information available

Teratogenicity:

No specific information. Developmental effects observed in laboratory animals after oral administration of boric acid, but only at maternally toxic levels (increased liver and kidney weight).

Reproductive Effects:

Tests with laboratory animals indicate effects testes and fertility. Doses were much larger than could be encountered under normal occupational exposure. No effects in a human study of occupational exposure.

Mutagenicity:

No information available

Synergistic Products:

None found

PREVENTIVE MEASURES

Engineering Controls:

Local exhaust ventilation recommended.

Respiratory Protection:

Dust mask. Up to 50 mg/m³: NIOSH approved dust/mist respirator. Up to 100 mg/m³: dust/mist respirator except single-use or quarter-mask respirator. Up to 250 mg/m³: powered air-purifying respirator with high-efficiency particulate filter(s), or supplied-air respirator with tight-fitting face-piece operated in continuous-flow mode or or powered air-purifying respirator with tight-fitting face-piece and high-efficiency particulate filter, or full face-piece self-contained breathing apparatus, or full face-piece supplied-air respirator. Up to 500 mg/m³: full face-piece respirator with high-efficiency particulate filter(s), or powered air-purifying respirator with tight-fitting face-piece and high-efficiency particulate filter(s), or full face-piece supplied-air respirator. Up to 2,000 mg/m³: positive-pressure supplied-air respirator. Higher or unknown concentrations, as in fire or spill conditions: positive-pressure, full face-piece self-contained breathing apparatus, or positive-pressure, full face-piece supplied-air respirator with auxiliary positive-pressure self-contained breathing apparatus.

Eye Protection:

Chemical safety goggles.

Skin Protection:

Rubber or plastic gloves. Other protective clothing, plastic apron, sleeves, sufficient to prevent contact.

Other Personal Protective Equipment:

Safety shower and eye-wash fountain in work area.

Leak and Spill Procedure:

Ventilate area. Cleanup personnel should be thoroughly trained in the hazards of this chemical, and should wear protective equipment and clothing sufficient to prevent inhalation and contact with skin and eyes. Collect spill carefully without raising dust; wet if necessary to control dust. Transfer into container for removal by disposal company. Wash site of spillage thoroughly with water and detergent.

Waste Disposal:

Follow all federal, provincial and local regulations for disposal.

Handling Procedures and Equipment:

Workers should be trained in the hazards of this substance and its safe use. Follow routine safe handling procedures. Avoid generating dust. Avoid contact with skin and eyes, and inhalation of dust or fumes. Use the smallest amount possible for the purpose, in an area with proper ventilation system.

Storage Requirements:

Store in suitable, labelled containers., in a cool, dry,

well-ventilated area, out of direct sunlight and away from incompatible materials. Protect from damage and freezing. Keep containers tightly closed when not in use and when empty.

FIRST AID MEASURES

Specific Measures:

Eyes:

Flush thoroughly with gently running water, for at least fifteen (15) minutes, holding eyelids open while flushing. Get medical advice if irritation develops.

Skin:

Remove contaminated clothing, including watches, rings, belts, and shoes. Drench skin with plenty of running water for at least fifteen (15) minutes, or until no trace of chemical remains. If there are any breaks in the affected skin, or if irritation develops, get medical attention.

Inhalation:

Remove to fresh air. Give oxygen and get medical attention for any breathing difficulty.

Ingestion:

If victim is alert and not convulsing, give 1 to 2 glasses of water to drink to dilute. Induce vomiting immediately, under medical supervision. Rinse mouth and administer more water. Obtain medical attention immediately.

Note to physician:

Gastric lavage with 5% sodium bicarbonate, followed by saline catharsis, is suggested. Assure adequate hydration. After ingestion of 10 g or more, symptoms may occur after 24 to 72 hours.

REFERENCES USED

CCINFO disc: Cheminfo, MSDS's, May 2003

Budavari: The Merck Index, 12th ed., 1997

Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued:

May 20, 1991

Revision:

May 2012

MSDS:

2250-1

Proposed WHMIS Designation:

D2A; D2B

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