



Boric Oxide

B_2O_3
Diboron trioxide
Grades: 4-Mesh, 60-Mesh, and 200-Mesh

CAS Number 1303-86-2

A pure form of B_2O_3

Boric oxide is a hard, glassy, granular material. Exposed to the atmosphere it slowly absorbs water, reverting to boric acid. Approximately 56.3kg of boric oxide are the chemical equivalent of 100kg of boric acid.

Applications

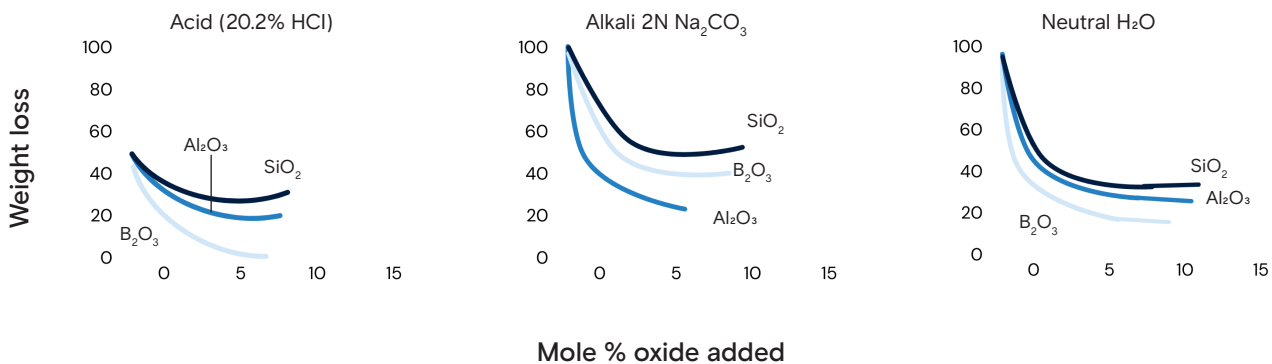
Boric oxide is used where B_2O_3 is required without the presence of sodium or calcium and/or where water would be detrimental to the process.

Specialty glasses

Pure B_2O_3 is needed for the production of certain types of glasses including optical and telescope lenses, medical glasses (ampoules), electronic glasses, and glass-ceramic composites. Boric oxide in glass formulations reduces melting temperature, increases thermal resistance and mechanical strength, and enhances aqueous and chemical durability.

Boric oxide improves resistance of glass to aqueous and chemical attack as weight loss tests show.

From *Glass* by Horst Scholze, 1991





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Specialty ceramics

Used to produce high-strength and heat-resistant ceramic products such as boron carbide, boron nitride, titanium and zirconium diborides, as well as elemental boron.

Refractories

Used in chemically bonded firebricks and castables which require resistance to high temperature, abrasion, and corrosion. Boric oxide is used as a binder for magnesia-based refractory bricks and as a stabilizer for dolomite refractory bricks commonly used in steel smelting furnaces.

Glazes and enamels

Increases the strength, scratch resistance, and chemical resistance of ceramic wares such as tiles, tableware, porcelain, and enameled appliances. Boric oxide may increase manufacturing yields.

Chemical reactions

Used in the preparation of elemental boron, boron halides, sodium borohydride, metallic borates, and borate esters. It is also used as a catalyst in the conversion and synthesis of many organic compounds.

Metallurgy

An excellent solvent for metallic oxides at high temperatures. Boric oxide is used in the preparation of special welding and soldering fluxes, in chemical-bonded refractories, in the hardening of steel, and in the production of alloys with iron, nickel, or manganese. It is also used to produce amorphous metal and rare-earth magnets.

Characteristics

Molecular weight	69.62
Specific gravity	1.84
Melting Point	450-465°C (842-869°F)
Heat of solution (absorbed)	4.81 x10 ⁵ J/kg (207 BTU/lb)

Solubility

It is soluble in water but at a much slower rate than boric acid.

Melting point

The normal glassy form of boric oxide has no definite melting point. It begins to soften at about 325°C (617°F). Two crystalline forms can be obtained under high pressure. One of these can also be made at atmospheric pressure. The melting point of the latter has been reported as 450°±2°C if made at atmospheric pressure and 465°±10°C if made at high pressure.

Stability

Boric oxide is a hygroscopic product. Avoid exposure to water or humidity, as this may cause caking. If wetted it reacts exothermically, forming boric acid. When storing, maintain package integrity.

Containers

May be available in bulk, IBCs, or small bags



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About U.S. Borax

U.S. Borax, part of Rio Tinto, is a global leader in the supply and science of borates—naturally-occurring minerals containing boron and other elements. We are 1,000 people serving 650 customers with more than 1,800 delivery locations globally. We supply around 30% of the world's need for refined borates from our world-class mine in Boron, California, about 100 miles northeast of Los Angeles.

About 20 Mule Team products

U.S. Borax produces the *20 Mule Team*® borates family of products from naturally occurring minerals and have an excellent reputation for purity and safety when used as directed. Borates are key ingredients in a number of industrial applications including fiberglass, glass, ceramics, batteries and capacitors, wood preservatives, and flame retardants.

High quality, high reliability, high performance borate products. It's what we're known for.

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