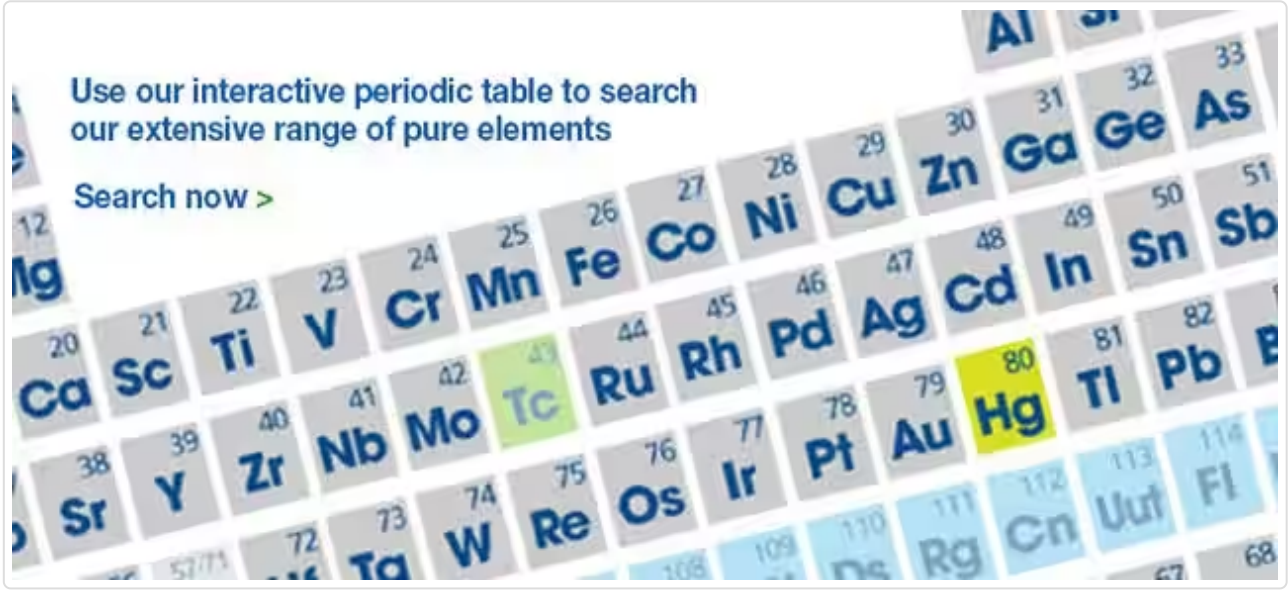
Inorganic Boron Compounds

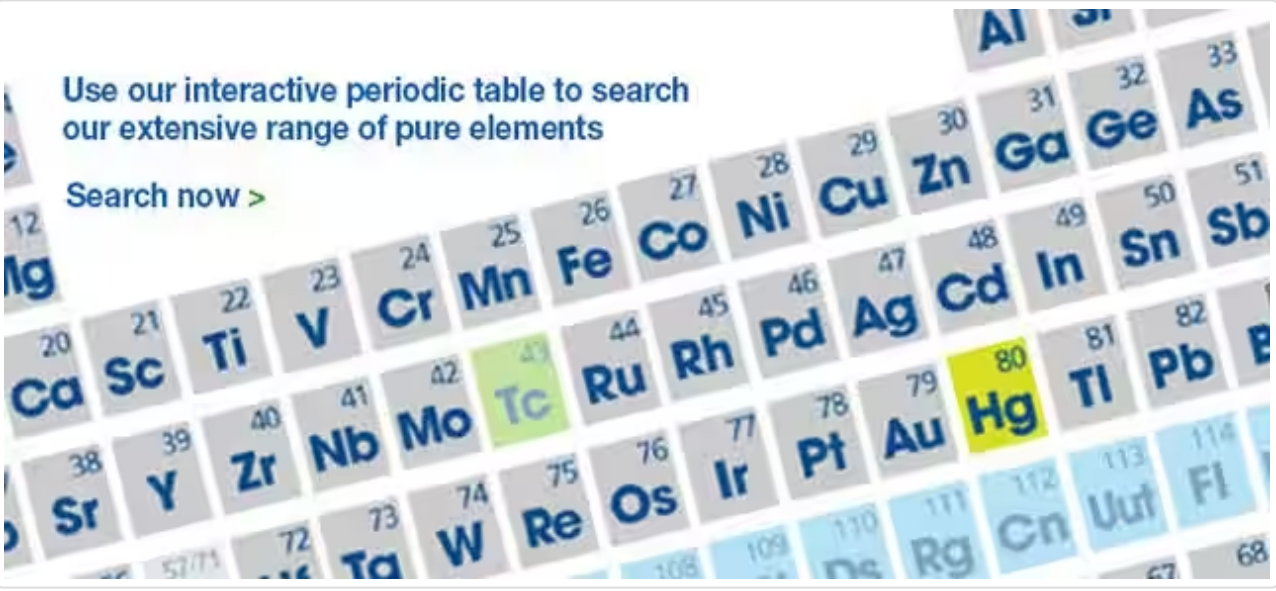
Many inorganic boron compounds are electron-deficient, which is what accounts for boron being a strong Lewis acid, accepting protons (H^+ ions) in solution. Boron compounds include metal borates, boric acid, boric oxide, and boric acid esters.

Borate salts produce basic solutions that are used in cleaning agents. Other boron compounds are used in a variety of things including adhesives, cement, disinfectants, fertilizers, fire retardants, glass, herbicides, metallurgical fluxes, and textile bleaches and dyes. Inorganic boron compounds find large-scale applications in many industries, most notably in the manufacture of glass and other vitreous materials. Inorganic boron compounds are used in organic synthesis specifically as catalysts and reducing agents.



Borides

A boride is a binary compound of electronegative boron with an electropositive element or radical. Borides comprise a large group of compounds and are stable. They are high melting, hard and non-ionic in nature. They possess semiconducting and superconducting properties. Few representative examples are MgB2, TiB2, ZrB2, CrB, MoB, SiB3 and WB. Metal-rich borides (e.g. TiB2) can have higher conductivities than parent metals.



41721	Calcium boride, 95+%
41722	Calcium boride, 99.5% (metals basis)
41551	Calcium boride, 99+% (metals basis)
12570	Chromium boride, 99% (metals basis)
39225	Gadolinium boride, 99.5% (metals basis)
43664	Hafnium boride, 99.5% (metals basis excluding Zr), Zr <2%
88146	Iron boride, 98%
22952	Iron boride, 98% (metals basis)
40325	Lanthanum boride, 99.5% (REO)
88149	Magnesium boride, 99% (metals basis)
43680	Molybdenum boride, 99.5% (metals basis)
12563	Molybdenum boride, 99% (metals basis)
39494	Neodymium boride, 99.5%
13110	Nickel boride, 99% (metals basis)

	12573	Niobium boride, 99% (metals basis)
	11364	Titanium boride
	44558	Titanium boride, 99.5% (metals basis)
	41664	Tungsten boride, 99.4% (metals basis)
	12559	Tungsten boride, 99% (metals basis)
	47030	Zirconium boride, 99.5% (metals basis excluding Hf)
	12140	Zirconium boride, 99.5% (metals basis excluding Hf)

Borohydride

The anion BH4- and its salts are referred to as borohydrides. These compounds are used as reducing agents in organic synthesis. Sodium borohydride and lithium borohydride are the most important borohydrides. One of the main uses of sodium borohydride is in the reduction of sulphur dioxide to give sodium dithionite, which is employed to bleach wood pulp.

Sodium borohydride is frequently used in fine chemical and pharmaceutical industries, especially in the reduction of aldehydes and ketones in the production of atropine, chloramphenicol, scopolamine and vitamin A. The widespread use of borohydrides for the reduction of aldehydes and ketones is attributed to its ready availability, mild reaction conditions, ease of work-up, high stability and high yields. Several chiral borohydrides have been developed to efficiently achieve enantioselective and diastereoselective reductions of carbonyl compounds.

Metal borohydrides M(BH4)n (n is the valence of metal M) have high hydrogen density, and are therefore regarded as potential hydrogen storage material (Review: Recent Progress in Metal Hydrides for Hydrogen Storage, Li, H.- W. et al., Energies, 2011, 4, 185-214). Borohydrides have the potential to be used as fuel cells. Recent research is ongoing in direct borohydride fuel cells (DBFC). For portable applications, DBFC is a promising power system. Additional applications include waste water treatment and paper pulp bleaching.

A13730	Bis(triphenylphosphine)copper(I) borohydride
32563	Lithium borohydride, 95%
H36830	Lithium triethylborohydride, 1.7M in THF, packaged under Nitrogen in resealable AcroSeal[t bottles
89144	Lithium triethylborohydride, 1M in THF
42491	Lithium triethylborohydride, 1M in THF, packaged under Argon in resealable ChemSeal□ bottles
43034	Lithium tri-sec-butylborohydride, 1.0M solution in THF, packaged under Argon in resealable ChemSeal□ bottles
46847	Potassium borohydride, 98%
32570	Potassium borohydride, 98%
35788	Sodium borohydride, 97+%
13432	Sodium borohydride, 98%
38788	Sodium borohydride, 98%
88983	Sodium borohydride, 98% min

87659	Sodium borohydride, stable aq. soln., 4.4M in 14M NaOH
87839	Sodium cyanoborohydride, 95%
B22060	Sodium triacetoxyborohydride, 95%
A17655	Tetramethylammonium borohydride, 95%
A17494	Tetra-n-butylammonium borohydride, 97%

Inorganic Borates

Inorganic borates are naturally occurring minerals. They are mined from naturally formed deposits in the earth. They exist in trace amounts in rock, soil, water and all living things. Borates are essential for plants and key ingredients in fiberglass, glass, ceramics, detergents and fertilizers. These inorganic salts are colourless and odourless. Inorganic borate compounds are salts of the oxyacids of boron, such as boric acid, H_3BO_3, metaboric acid, HBO_2 and tetraboric acid, $H_2B_4O_7$.

Applications include: furnishings and interior construction, such as framing, furring strips, sill plates, sheathing, trusses and joists. Borates find use in the glass, ceramic, enamel and porcelain industries. Borates are important components in bleaching and stain removal. They are used to control viscosity in paints, adhesives and cosmetics. Borates find use in modifying the structure of glass to make it resistant to heat or chemical attack. They facilitate the production of ultra-thin LCD screens, functional fiberglass and beautiful ceramic tiles and glazes. These compounds act as a flame retardant in cellulose insulation.

12294	Ammonium pentaborate octahydrate, 99.0%
46323	Ammonium pentaborate tetrahydrate, 98%
44055	Ammonium tetrafluoroborate, 99.999% (metals basis)
47321	Cadmium borate, 98+%
47342	Cadmium borate hydrate, 99+%
12988	Calcium metaborate, 99.992% (metals basis)
39339	Lead(II) metaborate monohydrate
36760	Lithium metaborate, ACS, 98.0-102.0%
12591	Lithium metaborate, anhydrous, 99.9% (metals basis)
32576	Lithium metaborate, anhydrous, tech.
47375	Lithium metaborate dihydrate, 99+%
A16145	Lithium metaborate, dried, 99%
10739	Lithium metaborate, Puratronic®, 99.997% (metals basis)

12592	Lithium tetraborate, 99.6% (metals basis)
13419	Lithium tetraborate, 99% (metals basis)
10744	Lithium tetraborate, Puratronic®, 99.998% (metals basis)
A10358	Lithium tetraborate trihydrate, 96%
14532	Lithium tetrafluoroborate, ultra dry, 99.997% (metals basis)
43892	Magnesium tetraborate, 99%
47363	Nickel borate hydrate, Ni 38-41%
47365	Potassium metaborate hydrate, 99+%
39437	Potassium pentaborate octahydrate, 97%
39435	Potassium tetraborate tetrahydrate, 99%
H37954	Silver(I) tetraborate hydrate, 99%
36736	Sodium metaborate tetrahydrate, tech.
A10189	Sodium perborate tetrahydrate, 97%
33383	Sodium perborate tetrahydrate, Reagent Grade
12305	Sodium tetraborate, anhydrous, 99.5% (metals basis)
87862	Sodium tetraborate, anhydrous, 99.95% (metals basis)
10875	Sodium tetraborate, anhydrous, Puratronic®, 99.998% (metals basis)
A16176	Sodium tetraborate decahydrate, 99+%

Inorganic & Metal Complex Tetrafluoroborates

Tetrafluoroborate is the anion BF_4^-, which has a tetrahedral geometry. A few examples of inorganic tetrafluoroborates are: $Cu(BF_4)_2$, $AgBF_4$, and $Fe(BF_4)_2$. Examples for metal complex tetrafluoroborates include, but are not limited to, tetrakis(acetonitrile)silver(I) tetrafluoroborate, 2,6-bis[(di-tert-butylphosphino)-methyl]pyridine silver(I) tetrafluoroborate, and tetrakis(acetonitrile)copper(I) tetrafluoroborate.

11488	Ammonium tetrafluoroborate, 97%
35831	Ammonium tetrafluoroborate, 99.5% (metals basis)
30131	Calcium tetrafluoroborate hydrate
23142	Cobalt(II) tetrafluoroborate hydrate, 96%
89666	Copper(II) tetrafluoroborate, 45% aq. soln.
26127	Copper(II) tetrafluoroborate hexahydrate, 98%
41956	Lead(II) tetrafluoroborate, 50% w/w aq. soln.
11528	Lithium tetrafluoroborate, 98%
L13231	N-Fluoropyridinium pyridine heptafluorodiborate, 90+%
53108	Nickel(II) tetrafluoroborate hexahydrate
H34069	Nitronium tetrafluoroborate, 0.3 to 0.5M soln. in sulfolane
36374	Nitronium tetrafluoroborate, 90%
B20167	Nitronium tetrafluoroborate, 96%

A15806	Nitrosonium tetrafluoroborate, 98%
A15605	Potassium tetrafluoroborate, 98%
11556	Potassium tetrafluoroborate, 99%
B20817	Rubidium tetrafluoroborate, 98%
11562	Sodium tetrafluoroborate, 95%
A12393	Sodium tetrafluoroborate, 97%
89669	Tin(II) tetrafluoroborate, 50% w/w aq. soln.
85124	Zinc tetrafluoroborate hydrate, Zn 18% min