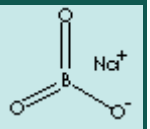
SODIUM PERBORATE MONOHYDRATE

PRODUCT IDENTIFICATION



CAS NO.	7632-04-4 (Anhydrous) 11138-47-9 (Hydrate) 10332-33-9 (Monohydrate) 10486-00-7 (Tetrahydrate)
EINECS NO.	239-172-9
FORMULA	$NaBO_3.H_2O$
MOL WT.	99.8
H.S.CODE	2840.30
TOXICITY	Oral rat LD50 : 2100 mg/kg
SYNONYMS	Perboric acid (HBO), sodium salt, monohydrate;

Perboric acid, sodium salt, monohydrate; Sodium borate monohydrate; Monohydrate de perborate de soude (French); Sodium peroxyborate; sodium peroxoborate; Peroxiborato de sodio; peroxoborato de sodio; Monohidrato de Percarbonato Sódico (Spanish);

DERIVATION CLASSIFICATION

GENERAL DESCRIPTION

Sodium perborate is a white, free-flowing crystalline compounds soluble in water. Sodium Perborate is a stable, solid source of active oxygen. Sodium perborate exists in the anhydrous , mono, tri and tetrahydrate forms (mono and tetrahydrate forms are important commercially). Sodium perborate tetrahydrate is prepared by reaction of sodium borate with hydrogen peroxide. Sodium perborate releases back hydrogen peroxide, if dissolved in water. Its properties in aqueous solution are practically similar to them of a solution of hydrogen peroxide. Accordingly, sodium perborate is considered as a solid form of hydrogen peroxide used as a strong oxidizing agent in various industry including in detergent. In comparison with solution of hydrogen peroxide, Solid form of sodium perborate compounds provide better conditions of stability and convenient handling. Sodium perborate monohydrate provides a high available oxygen content equivalent to 32% hydrogen peroxide - 50% more active oxygen than the same weight of sodium perborate tetrahydrate. Its oxidative power improves the cleaning, bleaching, stain removal and deodorizing performance. TAED (Tetraacetyl Ethylenediamine) can be added to lower down working temperature. The principal sources of boron for the production of sodium perborates are the minerals Kernite, $Na_2B_4O_7.4H_2O$, and Tincal, $Na_2B_4O_7.10H_2O$. Both the mono and tetrahydrate of sodium perborate are used as oxidising and bleaching agents in cleaning, cosmetic and pharmaceutical preparations but their main application is in detergents. Typically a detergent will contain up to 15 wt% of the tetrahydrate and/or up to 10% of the monohydrate. The monohydrate is preferred if rapid solution is required.

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	White crystalline powder
MELTING POINT	Decomposes
BOILING POINT	
SPECIFIC GRAVITY	
SOLUBILITY IN WATER	16 g/l
pH	Apprx 10 (1.5% Sol.)
VAPOR DENSITY	

AUTOIGNITION	
NFPA RATINGS	Health: 1 Flammability: 0 Reactivity: 1
REFRACTIVE INDEX	
FLASH POINT	
STABILITY	Stable but decomposes with liberation of oxygen in warm or moist air

APPLICATIONS
Heavy-duty Detergents, All-fabric Dry Bleaches, Automatic Dishwasher Detergent Tablets, Denture Cleaning Tablets, Institutional Cleaners, Institutional Laundry Products, Hair Care Products

SALES SPECIFICATION	
APPEARANCE	white granular powder
CONTENT	95.0% min
pH	9.0 - 11
OXYGEN	14.0 - 16.0%
MEAN PARTICLE SIZE	350 - 500 μm

TRANSPORTATION	
PACKING	25kgs in Bag, 14mts per container
HAZARD CLASS	5.1(Oxidizer)
UN NO.	1479

OTHER INFORMATION
Hazard Symbols: O, Risk Phrases: 8, Safety Phrases: 17

GENERAL DESCRIPTION OF BORON AND ITS COMPOUNDS

Boron is a nonmetallic element, group III in the periodic table. Symbol B; aomic number 5; atomic mass 10.811; melting point ca 2,300 C; sublimation point ca 2,550 C; specific gravity 2.37 or 2.34; valence +3; electronic config. [He]2s22p1. There are two allotropes of boron; amorphous boron is a dark brown to black amorphous powder, but metal-like crystalline solid is an extremely hard (9.3 on Mohs' scale), black to silver-gray, brittle, lustrous and has a bad conductor in room temperatures. The specific gravities of amorphous and crystalline forms are 2.37 and 2.34 respectively. The crystalline form is far less reactive than the amorphous form. The amorphous powder is oxidized slowly in air at room temperature and ignites spontaneously at high temperatures to form an oxide but the crystalline form is oxidized only very slowly, even at higher temperatures. Boron is widely distributed in the form of borates but is never found in the elemental form in nature. The important commercial borate products are borax penta (or deca) hydrate, boron oxide, sodium perborate, boric acid and minerals are borax, colemanite, ulexite, tincal, kermite, and brines as well as ascharite, hydroboracite, datolite, tourmaline, etc. The simple way to prepare boron of amorphous powder form is the reduction of boron trioxide by heating with magnesium. Boric acid is produced mainly from borate ores containing sodium or calcium by the reaction with sulfuric acid in the presence of a hot aqueous boric acid liquor to recycle.

Major end uses for borates include;

- FIBERGLASS AND GLASS : Boron fibers probide very high tensile strength and can be added to plastics to make a material that is stronger than steel yet lighter than aluminum. Boron is used primarily in fiberglass and boronsilicate glass which is the strong heat-resistant glass that contains a minimum of 5 percent boric oxide. The resistance to heat and chemical is attributable to the boric oxide which replace for sodium oxide in the structure of the glass, creating low thermal expansion. Replace for sodium oxide, Boric Oxide is a powerful base

offering a high quality of heat and chemical resistance. Boric compouds are important components in optical glass industry to reduce thermal and mechanical shocks but to increase chemical resistance and durability.

- CERAMICS : Boric compounds reduce significantly the melting point and can be used as an essential ingredient for the production of ceramic frits and borosilicate glazes. Boric compounds are used to control the coefficient of expansion to ensure that the glaze remains fixed with the body without crazing or distortion.
- AGRICULTURE AND FERTILIZER: Boron is an essential micronutrient for plant growth. Boron fertilizers mixed with other compounds or NPK fertilizers are useful boron-deficient soils.
- FLAME RETARDANT : Boron is an effective chemical flame retardant for an ample array of products. It is also used for wood, plywood, textile products, cotton, paper and cellulose.
- CORROSION INHIBITOR : Different boric composition can be used as Corrosion Inhibitors and anti-freeze (mixed with Ethylene Glycol in automobile motor cooling systems), as well as in brewing, heat treating, hydraulic fluids, and treatment of metallic products.
- WOOD PRESERVATIVES and PESTICIDES : Borates and Boric Acid are very effective in controlling and eliminating insects and fungi. Though they are not harmful to mammals, they are toxic against cockroaches, ants, scarabs, larvae, and other insects, resulting in manipulation at any location and environment.
- METALLURGY : Boron is used as a sealing for non-ferrous metals and used as a deoxidizer and degasifier in metallurgy. Because it absorbs neutrons. It is used in the production of steel. Traces of Ferro boron in boric steel increase its strength. Bron eliminates impurities metallurgist systems, resulting in highly pure material to be used in electrical conductors especially.
- PHARMACEUTICALS AND COSMETICS : Boric Acid is recognized for its application as a pH buffer and as a moderate antiseptic agent and emulsifier. It is a component of ointments, mouth-washes, eye-drops, bath salts, creams and shampoos. It is also known boron compounds made with all 10B isotope selectively destroy cancer cell.
- NUCLEAR APPLICATIONS : Boron is used in the shielding material, in neutron detection and in some control rods of nuclear reactors as it absorbs neutrons.