Product Data Sheet

Dehybor®

$Na_2B_4O_7$
Sodium Tetraborate
Anhydrous Borax
Technical Grade: 12 mesh, 30 mesh, 80 mesh, Fine, and Extra Fine

CAS/TSCA Number 1330-43-4

Dehybor® is a product resulting from the dehydration and fusion of borax. It is a hard, glassy material, granular in texture. *Dehybor* does not rehydrate under ordinary storage conditions, and can be handled in bulk. It is an excellent flux and glass former. In aqueous solution it can provide slow release of boron.

The use of *Dehybor* can help to increase yields and reduce energy consumptions in glass, ceramic and enamel frit production.

Applications and benefits

Glasses

Dehybor is used as a source of B_2O_3 in the manufacture of many different types of borosilicate glass, including heat and chemical resistant glasses, illumination glasses, optical lenses, medical and cosmetic containers, hollow microspheres and glass beads. In the manufacturing process *Dehybor* has advantages over borax (5 and 10 mol) having a higher bulk density and melting more rapidly with minimum energy. It can increase furnace production. It also provides a source of sodium and can be used with boric acid or boric oxide to control the sodium oxide/boric oxide ratio in the glass.

B_2O_3 acts as both a flux and network former and is used to formulate glasses with low thermal expansion (high thermal shock resistance) and good chemical durability.

Frits, glazes and enamels

Glazes and enamels provide decorative and protective coatings for ceramics (wall and floor tiles, tableware and porcelain) and metals (plumbing fixtures, cookware and appliances). As in the case of glass, B_2O_3 allows the formulation of low melting glazes and enamels with the correct thermal expansion. In enamels the borate improves adhesion to the metal by dissolving iron oxide and reducing the melt surface tension.

Metallurgy

Dehybor is an excellent solvent for metallic oxides at high temperatures. In the field of metallurgy, *Dehybor* is used as a cover flux to protect metal surfaces from air oxidation. *Dehybor* also serves as a scavenger to dissolve metallic oxides and other contaminants in the production of ferrous and non-ferrous metals. Since boron is regarded as a unique and highly versatile alloying element in steel, *Dehybor* can be used to improve the properties and processing behavior of steel products.

Cleaning products

Dehybor is used in the formulation of slow-dissolving cleaning briquettes that are based on gelled or solidified borate suspensions. For example, in toilet bowl cleaners, the slow release of borate softens water to prevent scale build-up, while deodorizing, and inhibiting stain formation.

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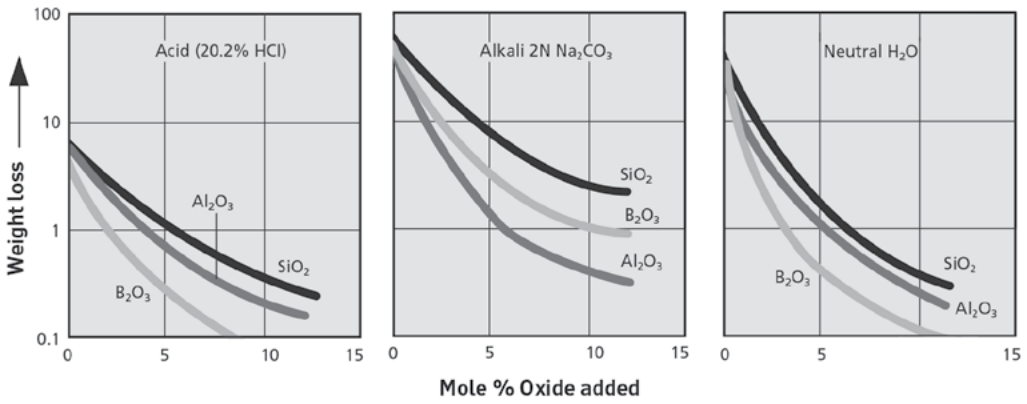
Refractories

Borate compounds are used as stabilizers and bonding agents in firebricks and castables. *Dehybor* gives an intermediate-temperature glassy bond prior to the establishment of the ceramic bond, at which point the borate compound is frequently volatilized from the system.

Enhanced oil recovery

Being effective cross-linking agents, borates are finding increasing uses in the oil industry. High viscosity oil-well fluids made from the reaction between *Dehybor* and polymers are utilized to increase the recovery of oil from subterranean formations.

Boric oxide improves resistance of glass to aqueous and chemical attack as weight loss tests show.
From Glass by Horst Scholze 1991



Physical and chemical properties

Stability

Dehybor is a stable fused product which does not change chemically under normal storage conditions. If wetted it reacts exothermically, forming hydrated sodium borates. When storing the product care should therefore be taken to avoid exposure to a humid atmosphere. This may cause caking. Also, it is, of course, essential to maintain the integrity of the packaging.

Characteristics	
Molecular Weight	201.22
Specific Gravity	2.40
Melting Point	743°C (1369°F)
Heat of solution (absorbed)	$1.93x10^5$ J/kg (83BTU/lb)

Chemical composition	
B_2O_3	69.2%
Na_2O	30.8%

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