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 B₂O₃ 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.

B₂O₃ 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, B₂O₃ 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.
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.

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.

Refactories
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.

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