A DR reader writes (4/5/95):

Boron is a common component in control rods for fission reactors. During the Manhattan Project the folks at Hanford and Los Alamos were forbidden to wash their clothes in boron bleach due to fears it would interfere with the development of the a-bomb.

Grolliers Encyclopedia Entry...

boron
{bohr'-ahn}

Boron is a metalloid chemical element with properties intermediate between those of carbon and aluminum. Its chemical symbol is B, atomic number 5, and atomic weight 10.811. Boron is relatively rare, constituting only 3 ppm of the Earth's crust. It is most commonly found in the BORATE MINERALS borax, and kernite. The element was first isolated by Sir Humphry DAVY in 1807 and by Joseph GAY-LUSSAC and Louis THENARD in 1808.

Boron exists in an amorphous form as an extremely hard, blackish brown powder, and in three crystalline forms that look like metals. Crystalline boron is second only to diamond in hardness but is too brittle for use in metals.

Research suggests that boron may be nutritionally important. Apparently it helps to maintain appropriate body levels of minerals and hormones needed for bone health.

Uses

The low electrical conductivity of boron increases greatly as its temperature is raised. At certain temperatures, therefore, boron behaves as a SEMICONDUCTOR, and it is often added to germanium and silicon to increase their electrical conductivity. The use of cubic boron nitride as a high-temperature semiconductor is also being explored.

Small additions of boron to steel appreciably increase the hardness of the alloy. Boron is also used in the production of pure, strong metals to remove the oxygen and nitrogen dissolved in the metal or chemically bound to it, and it is used to absorb fast neutrons in nuclear reactors.

The most important boron compound is borax, which has been used in pottery glazes since the Middle Ages. Borax deposits were first found in Tibet, and borax was brought to Europe by the Arabs. It is still important in the ceramic industry. Borax combines with chromium, copper, manganese, cobalt, and nickel to form beautifully colored compounds. Borax beads were once used as a reagent in the detection of these elements. Borax is also important in the production of borosilicate glass, which has a high refractive index and is suitable for the manufacture of

lenses. Other applications of borax include the impregnation of textiles and wood to make them fire resistant; softening water for laundry; and as a flux in brazing (dissolution of oxides). A weak base, borax is also used in buffer solutions and photographic developers.

Since boron is important in the calcium cycle of plants, borax or boric acid is often added to boron-poor soils as a fertilizer. Boric acid is obtained by the action of strong acids on borax and is used as a mild disinfectant. Although its toxicity is low, it is not completely harmless. Its use as a food preservative is prohibited in many countries.

Boron Chemistry

Boron has three valence electrons and forms covalent compounds almost exclusively. It generally forms planar, three-bonded compounds with 120 degree bond angles. These compounds have only six bonding electrons. The boron atom can attain a rare gas configuration, with eight bonding electrons, in reactions of molecules with free electron pairs. Boron forms compounds with nitrogen in a similar way.

Bibliography: Alekseev, N. V., et al., Structural Chemistry of Boron and Silicon (1986); Greenwood, N. N., The Chemistry of Boron (1975); Wells, A. F., Structural Inorganic Chemistry, 5th ed. (1983).