

can withstand concentrations approaching 15 mg/m³ before complaining of ocular or nasal irritation. An adequate ventilation system should be employed to maintain airborne dust below the TLV. If circumstances arise which do not permit adequate control at the source, then approved respiratory protective devices should be used to prevent inhalation of bisphenol A dust. Clothing must be frequently laundered to prevent continuous skin contact, personal cleanliness is essential to avoid skin difficulties.

Boric acid has been used for many years as a mild disinfectant and a soothing and slightly astringent wet dressing or ointment with little attention to its toxicity.

Poisoning is not usually an industrial problem since the human system processes and eliminates fairly large quantities of boric acid without trouble, but it may result from misguided first-aid attempts.

Boric acid is not readily absorbed through the intact skin, but may be absorbed through large areas of skin which are seriously damaged, as in burns or areas of superficial lacerations. If such areas are dusted with boric acid or covered with strong boric acid ointment, toxic amounts may be absorbed.

Boron hydrides are a series of compounds analogous to the hydrocarbons, and include diborane, pentaborane, and decaborane, which have found use as high-energy fuels.

Diborane is primarily a lung-injuring material and produces lung changes in rats in one to four weeks of daily exposure at about 2 ppm. The compound has an odor, but it is not detectable at a low enough concentration to act as a warning of the possibility of chronic poisoning.

Pentaborane, unlike diborane, principally affects the central nervous system. In laboratory animals it produces first a temporary excitement and hypersensitivity which may lead to convulsions, and then a profound depression.

Decaborane is similar in its action on the system to pentaborane. It can be cumulatively absorbed over a short series of exposures and the total dose, although less than a single lethal dose, may still cause death. In practice it is probably more dangerous to handle than pentaborane, since, in addition to being toxic by inhalation, decaborane is rapidly absorbed through the intact skin.

Attempts to treat or counteract its toxicity have been unsuccessful.

Boron hydrides should be handled only in a closed system in a well-hooded and ventilated area. Self-contained or supplied air respiratory protection should be provided if the system must be opened (filter-type respirators are not effective). For the handling of decaborane, impervious clothing should also be used to prevent skin contact.

See Industrial Data Sheet 508.

Brass, chiefly an alloy of copper and zinc, may also contain lead. Melting of brass may produce copious quantities of zinc oxide fume which, if inhaled, may give rise to the signs and symptoms of metal fume fever. (See listings for Copper, Lead, and Zinc in this chapter.)

Bromine is a dark red, low-boiling liquid which produces large quantities of extremely irritant, nonflammable vapor at room temperature or above. Its physiological effects are about the same as those of chlorine—irritation of all mucous membranes and the lungs and spasm of the glottis when inhaled in fairly large concentration. A bromine concentration of 40 to 60 ppm is reported to be dangerous on short exposure.

The irritant action of bromine is not related to the bromide intoxication seen from time to time from continued overdoses of bromides as sedatives. In bromide intoxication, the most notable effects are on the central nervous system and are seen as slurring of speech, somnolence, difficulty in walking, and various psychic disturbances, depending on the personality of the individual involved.

See Industrial Data Sheet 313 and *Hygienic Guide*.

Bromochloromethane (methylene chlorobromide). Knowledge of effects in humans is limited at present. Anesthesia is the primary hazard from single exposure to high concentrations and organic (liver) injury is likely only if severe anesthetic effects are apparent. Repeated exposure to moderately excessive concentrations is likely to result in slight liver injury. The material has a low oral toxicity and does not present a problem from skin absorption. Bromochloromethane is slightly irritating to the eyes and has a defatting effect on the skin.

Fire extinguishers containing bromochlor-