

the skin, but primarily because it will almost certainly involve excessive inhalation of the vapor

Benzene hexachloride—see **Hexachlorocyclohexane**.

Benzoyl peroxide. The principal hazards of benzoyl peroxide are due to its flammable and explosive properties. Its principal effects are related to irritation and sensitization upon contact with the skin. Systemic toxicity in man has not been reported. No objectionable subjective symptoms were experienced when employees were exposed to dust concentrations ranging from 1.34 to 5.25 mg of benzoyl peroxide per cubic meter of air.

Concentrations of 12.2 mg/cu m and higher resulted in pronounced irritation of the nose and throat. The analysis of the air-borne dust showed that it contained potassium alum in addition to benzoyl peroxide, but the effect produced by the alum was considered to be negligible.

Benzyl chloride is a colorless liquid used in a variety of chemical syntheses. Its vapor is a potent irritant to the eyes, nose, and throat and may cause lung edema. The liquid may cause severe corneal injury.

Beryllium. Among the occupational diseases produced by beryllium, the first condition reported (in 1943) was an acute chemical pneumonitis, which occurred among workers exposed to beryllium compounds and was attributed largely to the fluorides.

A delayed reaction to beryllium, characterized as chronic and appearing as late as two or three years after the exposure which caused it, was reported some time later. Even more recently, it has been reported that the delay between last exposure to beryllium and the appearance of symptoms may be as long as ten years. This condition showed a granulomatous lesion of the lungs as the most striking effect, accompanied by general metabolic disturbances and anemia so that the individual had continuous weight loss and great weakness in addition to a chronic cough. A large number of cases of dermatitis attributed to beryllium and beryllium compounds have also been reported.

Although as recently as 1940 beryllium was thought to be reasonably harmless, it has since been declared that it is unquestionably a toxic agent and in such small quantities as to be among the most toxic chemically of all elements yet investigated. Acute effects have been brought about in animals with beryllium in quantities in the order of millimicrograms. Field survey evidence shows that still smaller quantities may produce the chronic disease in human beings. "Safe" levels of beryllium exposure may ultimately be set well below one $\mu\text{g}/\text{cu m}$ of air.

It has also been established that a worker may carry home enough beryllium compound on his clothes to result in illness in some member of his family. Several investigators have demonstrated that the presence of fluorine contributes to toxic action of beryllium.

Recommendations issued by the Atomic Energy Commission for the control of beryllium hazards in atomic energy installations state as follows:

- 1 The in-plant atmospheric concentration of beryllium at beryllium operations should not exceed two μg per cu m as an average concentration throughout an eight-hour day.
- 2 Even though the daily average is within the limits of recommendation No. 1, no personnel should be exposed to a concentration greater than 25 $\mu\text{g}/\text{cu m}$ for any period of time, however short.
- 3 In the neighborhood of an AEC plant handling beryllium compounds, the average monthly concentration at the breathing zone level should not exceed 0.01 $\mu\text{g}/\text{cu m}$.
- 4 An individual showing any sign of chronic berylliosis should be excluded from further exposure to beryllium compounds.
- 5 There is no reason to exclude women from employment in plants handling beryllium.
- 6 Pre-employment and termination examinations, including chest radiographs, should be required of employees in beryllium plants.
- 7 Periodic chest radiographs should be made every six months on personnel exposed to beryllium.