

## ELEMENTS OF INDUSTRIAL TOXICOLOGY

and in man. However, it seems highly unlikely that this will ever become a common disease of man because of the severe irritation involved in inhaling even a very small concentration. The highest concentration producing no deaths in adult guinea pigs for an 8-hr exposure was 20 mg per cu m.

See Industrial Data Sheet 325 and *Hygienic Guide*.

Sulfur monochloride is still used to some extent as a vulcanizing agent in the rubber industry. It is a dark yellow, highly volatile liquid, which hydrolyzes rapidly in moist air to give hydrogen chloride, sulfur dioxide, and sulfur. Its extremely irritating effect on the skin, eyes, and respiratory system is due primarily to the hydrochloric acid formed in its hydrolysis.

The chemical is commonly dissolved in carbon disulfide which has no irritating or warning properties and is therefore much more hazardous both to health and to safety than sulfur monochloride.

Sulfur pentafluoride is an extremely toxic material. In experiments on rats, 10 ppm caused lung irritation in a one-hr exposure, for an exposure of 18 hr, 0.1 ppm caused lung irritation and 1.0 ppm was lethal. For an 18-hr exposure, 0.01 ppm had no observable effect.

Talc, as used in industry, covers a wide variety of materials, many of which are not talcs at all. The only one which has been specifically suggested as the cause of a pneumoconiosis is tremolite talc, a hydrous magnesium silicate occurring in needlelike form and rather closely related to asbestos. It is, however, only slightly active because the exposures cited have been to heavy air contamination for many years.

Talc has been demonstrated to produce granulomas when deposited in the body, and for that reason has been dropped from surgical use. One pulmonary case also showed granuloma and fibrosis apparently produced by the inhalation of talc used as a lubricant on patent leather.

See Chapter 39, "Industrial Hygiene" and Industrial Data Sheet 531 for discussions of talcosis.

Tar and pitch have been known for a great many years, particularly in England, as producers of skin cancer. The skin can-

cer of chimney sweeps is undoubtedly due to the tar fraction of the soot with which they work. Skin cancers of mule spinners were next reported when mineral oil was substituted for vegetable oil or whale oil in the spinning industry. High incidence of skin cancer among men exposed to oils, tar, or pitch has not been reported from the European continent or from the United States, although in both areas there have been several extensive investigations of this question.

Teflon resins are available in two types: the TFE resin (tetrafluoroethylene polymer) and the FEP resin (fluorinated ethylene-propylene polymer). Both are physiologically inert. The products of pyrolysis of Teflon below 392 F (200 C) are nonhazardous, but above this temperature, several fluorocarbon gases, hydrogen fluoride, and a sublimate are formed. These do not appear to be toxicologically significant until about 482 F (250 C).

At 716 F (380 C), small amounts of toxic gases, which have caused death by pulmonary edema in experimental animals, are evolved. The only known difficulty in human exposure has occurred when Teflon resins are processed at 644-725 F (340-380 C). At these temperatures, a condition somewhat like metal fume fever is exhibited, but recovery is rapid, usually in 48 hours or less. All operations that can lead to the pyrolysis of Teflon resins should therefore be prohibited, particularly smoking where the tobacco may be contaminated with Teflon dusts.

See *Hygienic Guide*.

Tellurium is found as a trace element in various minerals and is used in small amounts in a number of industries, especially the glass industry. It increases the machinability of some metals and improves the toughness of rubber hose and cable and the hardness of lead.

In man, the absorption of even a very small amount of tellurium in any form is immediately followed by the production of a garlicky odor in the breath and the sweat, due to the elimination of minute amounts of tellurium as methyl telluride. This elimination is likely to continue for weeks or months.

Hydrogen telluride, a poison gas similar to arsine and hydrogen selenide, destroys