

Elements of Industrial Toxicology

result of it. It occurs in hematite miners and in welders who work in confined spaces without enough ventilation.

Most authorities feel that the concentration of iron in the air should be kept below the point at which it collects in the lung.

Isophorone. Except for the effect of inhalation of the vapors of isophorone, there is little recorded information upon its physiological activity. Isophorone is considered to have a low degree of hazard to health by inhalation, even though it has a moderately high degree of toxicity by this route. Vapors are quite irritating and have an unpleasant odor to unacclimated humans, so that over exposure is not likely if its warning properties are heeded. One report states that a short exposure of unconditioned human volunteers exposed to concentrations of 25 ppm of vapors of isophorone was definitely irritating to the eyes, nose, and throat. Isophorone is classified as a primary skin irritant—brief contact can cause inflammation.

Isopropyl alcohol. Inhalation of isopropyl alcohol vapor can produce mild irritation of conjunctiva and mucous membranes of the upper respiratory tract. No cases of industrial poisoning have been recorded in the literature.

Isopropyl alcohol is potentially narcotic. In large amounts, it is more toxic and more narcotic than ethyl alcohol, but less so than n-propyl alcohol to animals. There is apparently little or no accumulation in the body. Mild irritation of the eyes, nose and throat was induced in human subjects exposed for three or five minutes to 400 ppm of isopropyl alcohol. From the viewpoint of comfort these subjects found 200 ppm to be the highest concentration acceptable for an eight-hour exposure. It has been stated that the minimum concentration with identifiable odor of isopropyl alcohol is 200 ppm.

Contact of the skin with solutions of isopropyl alcohol can cause solvent irritation type dermatitis.

Isopropylamine exhibits strong local irritant properties. It has good warning properties—at 5 to 10 ppm, its ammonia-like odor is definite, between 10 and 20 ppm, the odor becomes so strong that nose and throat irritation result from short exposures, workers

exposed to concentrations between 25 and 50 ppm experienced nausea and temporary impairment of vision. Repeated exposure of the skin to the liquid and vapors of isopropylamine may result in dermatitis. The eyes may be chronically irritated by the vapors. Employees should be instructed to minimize contact with isopropylamine liquid and vapors as much as possible. If work contact with the liquid or vapors is unavoidable, personal protective equipment should be used. Isopropylamine is primarily an acute irritant, and is capable of causing burns on contact. It is alkaline in nature and causes burns similar to those of strong solutions of ammonia.

The high volatility, low flash point, and relatively low ignition temperature produce a high potential fire and explosive hazard.

Isopropyl ether, like the other ethers, forms explosive peroxides upon standing in contact with air. Industrial exposure to isopropyl ether is most likely to occur through a direct contact with the skin or eyes due to an accidental spill, or through an inhalation exposure to low concentrations of the material in the atmosphere. Acute exposures to physiologically significant concentrations are rare because of the flammability associated with such concentrations.

The primary physiological response to isopropyl ether is that of general anesthesia. Even though it is somewhat more toxic than ethyl ether the vapor concentration necessary for this anesthetic effect is much higher than the concentration that causes irritation and unpleasant odors.

This compound is only slightly irritating to the skin and is capable of producing only minor injury to the eyes. It is not absorbed through the skin in harmful amounts.

Lead was one of the first industrial materials to be recognized as a serious health hazard, and it still accounts for many cases of disability. In industrial work, lead enters the system mainly in the form of dust by inhalation.

Lead compounds can produce poisoning when they are swallowed, but absorption from the digestive system is slow and inefficient, so that large doses of most lead compounds are required and poisoning develops slowly. In the respiratory system, on the other hand, most lead compounds are ab-