C1C6 VCM

Vinyl Chloride Monomer is a toxic, extremely flammable chemical. It is a gas at normal atmospheric conditions. As such the major concern for health effects is as a result of breathing Vinyl Chloride vapors.

Vinyl chloride is a recognized or known human carcinogen. However, this effect is seen only after long-term exposure to relatively high concentrations. Experimental animals and some chemical workers exposed for many years to high concentrations of vinyl chloride have developed a rare liver cancer known as angiosarcoma. Based on studies done to date, there have been 115 cases of this rare cancer reported in the Western world that can be attributed to vinyl chloride exposure. This makes vinyl chloride a relatively weak carcinogen. In comparison, a recently proposed OSHA standard for benzene estimated that benzene exposures in the 1 - 10 ppm range cause 44 - 100 excess cancer cases a year.

It should be emphasized that this health effect is a result of long-term, usually greater than 10 years, daily exposure to high levels of vinyl chloride (probably greater than 50 ppm).

Vinyl chloride has long been considered to be very low in toxicity by acute or short-term inhalation. Experimental animal data shows that rats, mice, and guinea pigs exposed to 10% by volume in air of vinyl chlorine (100,000 ppm) experienced no deaths. Deaths began to occur in 20 - 30% by volume range of exposure.

In high concentrations, vinyl chloride acts as an anesthetic producing narcotic effects. These effects are generally reversible when the exposure ceases with little or no long-term effect. In fact in the late 1930"s VCM was considered as a candidate for human surgical anesthetic gas.

By contrast, Methyl Isocyanate, the chemical made infamous by the Bhopal incident, is a poison. This chemical can have irreversible effects, including death at very low levels of exposure. Respiratory and eye irritation occurs in humans at levels as low as 0.5 ppm. Experimental animal deaths have occurred with exposure to 5 ppm for 4 hours and 21 ppm for 2 hours. The recommended occupational exposure limit (TLV) is 0.02 ppm vs. 1.0 ppm (OSHA PEL) for vinyl chloride.