

Letter to the Editor

Dear Editor:

Over the past several weeks, there have been references in the paper both in news stories and letters to the editor regarding vinyl chloride. Some of these statements have been erroneous, and I think it might be helpful to your readers to review what is known about the health effects of vinyl chloride.

The health effects of vinyl chloride have been well documented in the medical literature and can be divided into acute effects (those due to short term exposure) and chronic effect of vinyl chloride is anesthesia which occurs in individuals exposed to levels in the 8,000 to 10,000 ppm (parts per million) range. This would be approximately one percent concentration. The chronic effects of vinyl chloride exposure include effects on blood vessels, skin, bone, and liver; and the rare cancer, angiosarcoma of the liver. All of these effects are seen only in individuals who have been exposed to levels of hundreds of parts per million over many years.

In the 1940's and 1950's it was believed that vinyl chloride was not dangerous, and that the only concern was its anesthetic effects on the central nervous system. During these years workers who cleaned reactor vessels in vinyl chloride polymerization plants were consistently exposed to levels of vinyl chloride estimated to be 600 to 1,000 ppm. Some of these workers developed changes in the blood vessels in the extremities, the skin, the bones of the fingers, and enlargement of the liver. In 1974, a rare form of cancer, angiosarcoma of the liver, was found to occur more frequently in workers at vinyl chloride polymerization plants who had experienced long term high levels of exposure to vinyl chloride. This tumor can also be caused by exposure to anabolic steroids (drugs used by some athletes to enhance performance) and Thorotrast (an x-ray contrast material which is no longer used). A worldwide registry looked at the question of possible increase brain and lung cancer due to vinyl chloride exposure. There have been articles published which

of all cases of angiosarcoma of the liver due to vinyl chloride exposure is maintained. As of 1988, there had been 138 cases in the world including 79 in Europe and 50 in North America. There have been no cases of angiosarcoma of the liver in vinyl chloride workers in Louisiana.

In 1976, the Occupational Safety and Health Administration established a limit of one ppm for exposure to vinyl chloride in the workplace. All of the previously described acute and chronic health effects occur only at exposures of hundreds of thousands of ppm.

Questions have been raised about the possibility that vinyl chloride causes other types of cancer in workers or in people who live in the vicinity of a vinyl chloride plant. Sir Richard Doll, a noted English epidemiologist, published a comprehensive study in 1988 of the health effects of vinyl chloride. He reviewed all the available literature on the subject and focused on four primary studies which included over 17,000 vinyl chloride workers. Two of his conclusions were: 1) "The facts are outstanding. First, the men have experienced a specific hazard of a type of cancer that is normally extremely rare, namely, angiosarcoma of the liver." and 2) "The second outstanding observation is that the mortality of the exposed men, other than that due to angiosarcoma of the liver is typical of the normally healthy industrial worker - that is not to say that no other hazard exists, but that the effect of any other hazard is small." By this, Doll is saying that while it is impossible to ever state with absolute certainty that no other hazard is present, if any other health hazard does exist, it is so small as to be undetectable.

In addition, Doll looked at the question of whether there is any health effect on people living near vinyl chloride facilities and concluded: "According to any reasonable criterion the hazard to the general public (if there is any at all) must be negligible." Doll also looked at the question of possible increased brain and lung cancer due to vinyl chloride exposure. Based

on all the data available, Doll did not conclude that there was an increased risk of these cancers.

Studies have also been done to address the possible reproductive effects of exposure to vinyl chloride. These studies have concluded that there is no increased rate of birth defects related to vinyl chloride exposure in populations living near vinyl chloride facilities, and there is no evidence of an increase in miscarriage rates due to vinyl chloride. One study done by Infante et. al. in 1976 suggested the possibility of an increase in miscarriage rates related to vinyl chloride, however, this study has been discredited by the academic community due to improper analysis of the data.

The health effects which have been seen have occurred in workers exposed prior to 1975 to very high levels of vinyl chloride over many years. These levels were in the hundreds to thousands of parts per million. Since the mid-1970's, the exposure levels for vinyl chloride workers have been dramatically reduced. At Dow's Louisiana Division facility, personnel and area monitoring for vinyl chloride have consistently been below one ppm. These measurements have been made in the vinyl chloride plant in those areas of the plant with the highest potential for vinyl chloride exposure. In addition, computer aided models have been used to estimate the maximum predicted concentrations of vinyl chloride in immediately surrounding communities based on levels of emission from Dow, Occidental, and B.F. Goodrich. These maximum predicted concentrations for the community are less than one one-hundredth of the OSHA workplace exposure limit.

Based on all this information, I agree with the conclusion reached by Doll that the risks of health effects in the community due to vinyl chloride, if present at all, must be negligible.

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