VINYLIDENE CHLORIDE (Group 3)

A. Evidence for carcinogenicity to humans (*inadequate*)

In one epidemiological study of 138 US workers exposed to vinylidene chloride, no excess of cancer was found, but follow-up was incomplete, and nearly 40% of the workers had less than 15 years' latency since first exposure[1]. In a study in the Federal Republic of Germany of 629 workers exposed to vinylidene chloride, seven deaths from cancer (five bronchial carcinomas) were reported; this number was not in excess of the expected value. Two cases of bronchial carcinoma were found in workers, both of whom were 37 years old, whereas 0.07 were expected for persons aged 35-39 years[1,2]. The limitations of these two studies do not permit assessment of the carcinogenicity of the agent to humans. No specific association was found between exposure to vinylidene chloride and the excess of lung cancer noted previously in a US synthetic chemicals plant[1].

B. Evidence for carcinogenicity to animals (*limited*)

Vinylidene chloride was tested for carcinogenicity in mice and rats by oral administration and by inhalation, in mice by subcutaneous administration and by topical application, and in hamsters by inhalation. Studies in mice and rats by oral administration gave negative results. In inhalation studies, no treatment-related neoplasm was observed in rats or hamsters. In mice, a treatment-related increase in the incidence of kidney adenocarcinomas was observed in male mice, as were increases in the incidences of

mammary carcinomas in females and of pulmonary adenomas in male and female mice. In skin-painting studies in female mice, vinylidene chloride showed activity as an initiator, but, in a study of repeated skin application, no skin tumour occurred. No tumour at the injection site was seen in mice given repeated subcutaneous administrations[1].

C. Other relevant data

No data were available on the genetic and related effects of vinylidene chloride in humans.

Vinylidene chloride did not induce dominant lethal mutations in mice or rats and did not induce chromosomal aberrations in bone-marrow cells of rats treated *in vivo*; however, it induced unscheduled DNA synthesis in treated mice. It did not induce chromosomal aberrations or mutation in Chinese hamster cells *in vitro* but did induce unscheduled DNA synthesis in rat hepatocytes. Vinylidene chloride was mutagenic to plant cells and induced mutation and gene conversion in yeast. It was mutagenic to bacteria[3].

References

[1]*IARC Monographs, 39*, 195-226, 1986

[2]Theiss, A.M., Frentzel-Beyme, R. & Penning, E. (1979) *Mortality study of vinylidene chloride exposed persons.* In: Heir, C. & Kilian, D.J., eds, *Proceedings of the 5th Medichem Congress, San Francisco CA, September 1977*, San Francisco, CA, University of California at San Franciso, pp. 270-278

[3]*IARC Monographs, Suppl. 6*, 570-572, 1987