DIETHYL SULPHATE (Group 2A)

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

A historical cohort study of 335 process workers and 408 chemical mechanics and refinery workers at a plant manufacturing isopropyl alcohol (see p. 229) and ethanol in a petrochemical complex showed excess mortality (standardized mortality ratio, 504) from upper respiratory (laryngeal) cancers based on four cases. These persons had spent most of their time working in the strong acid-ethanol plant, which produced high concentrations of diethyl sulphate[1].

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

Diethyl sulphate produced local tumours in rats following its subcutaneous administration and produced tumours of the nervous system after prenatal exposure. A few tumours of the forestomach occurred in rats given diethyl sulphate by gavage[2].

C. Other relevant data

Diethyl sulphate is an alkylating agent[2]. No data were available on the genetic and related effects of this compound in humans.

Diethyl sulphate induced chromatid breaks in mouse embryos treated transplacentally and dominant lethal mutations in mice. It induced unscheduled DNA synthesis in human cells *in vitro* and chromosomal aberrations, micronuclei, sister chromatid exchanges, mutation, DNA strand breaks and DNA alkylation in rodent cells *in vitro*. In *Drosophila*, it induced sex-linked recessive lethal mutations, crossing-over and chromosomal aberrations. It induced chromosomal aberrations, mutation and DNA damage in plants and mutation in fungi. It was mutagenic to bacteria[3].

References

[1]Lynch, J., Hanis, N.M., Bird, M.G., Murray, K.J. & Walsh, J.P. (1979) An association of upper respiratory cancer with exposure to diethyl sulphate. *J. occup. Med.*, *21*, 333-341

[2]*IARC Monographs*, *4*, 277-281, 1974

[3]*IARC Monographs*, *Suppl. 6*, 257-259, 1987