

CARBON TETRACHLORIDE (Group 2B)

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

Three case reports describe the occurrence of liver tumours associated with cirrhosis in people who had been exposed to carbon tetrachloride¹. A mortality study of laundry and dry-cleaning workers exposed to a variety of solvents suggested excesses of respiratory cancers (17 observed, 10.0 expected), cervical cancers (10 observed, 4.8 expected), liver tumours (4 observed, 1.7 expected) and leukaemia (5 observed, 2.2 expected)².

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

Carbon tetrachloride produced liver neoplasms in mice and rats after its administration by various routes^{1,3} and mammary neoplasms in rats following its subcutaneous injection¹. It also produced liver tumours in trout and hamsters following its oral administration¹, although these studies were not adequate.

C. Other relevant data

No data were available on the genetic and related effects of carbon tetrachloride in humans.

It did not induce chromosomal aberrations, unscheduled DNA synthesis or DNA strand breaks in cells of rodents treated *in vivo*. It did not induce chromosomal aberrations or sister chromatid exchanges in rat cells *in vitro*, but anaphase abnormalities were induced in cultured Chinese hamster ovary cells. It induced mutation, gene conversion and mitotic recombination in *Saccharomyces cerevisiae*, under conditions in which endogenous levels of cytochrome P450 were enhanced; there was a weak induction of mitotic crossing-over and mutation in *Aspergillus*. It was not mutagenic to bacteria⁴.

References

- ¹IARC Monographs, 20, 371-399, 1979
- ²Blair, A., Decouflé, P. & Grauman, D. (1979) Causes of death among laundry and dry cleaning workers. *Am. J. public Health*, 69, 508-511
- ³Kalashnikova, M.M., Rubetskoy, L.S. & Zhuravleva, M.V. (1980) Electron-microscopic and histochemical characteristics of hepatomas arising after prolonged administration of carbon tetrachloride (Russ.). *Bjull. eksp. Biol. Med.*, 89, 744-747
- ⁴IARC Monographs, Suppl. 6, 136-138, 1987