4,4′-METHYLENE BIS(2-METHYLANILINE) (Group 2B)

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

A study of an Italian cohort of 906 dyestuffs workers employed between 1922 and 1970 revealed an impressive excess of deaths from bladder cancer (36 observed, 1.2 expected). Workers were classified into ten exposure categories. Among 53 workers employed in the manufacture of new fuchsin ('new' magenta [see p. 238]) and safranine T, five died from bladder cancer, whereas 0.08 would have been expected. Their minimum length of employment was 12 years. Three of the five deaths occurred among workers engaged in the synthesis of *ortho*-toluidine (see p. 362) and 4,4′-methylenebis(2-methylaniline), used as precursors in the production of new fuchsin and safranine T, which was carried out in a separate building within the plant[1].

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

4,4′-Methylene bis(2-methylaniline) was tested for carcinogenicity by oral administration in rats and dogs, inducing high incidences of hepatocellular carcinomas in animals of each species; neoplasms of the lung, mammary gland and skin in rats and of the lung in dogs were also reported[2-4].

C. Other relevant data

No data were available to the Working Group.

References

[1]Rubino, G.F., Scansetti, G., Piolatto, G. & Pira, E. (1982) The carcinogenic effect of aromatic amines: an epidemiological study on the role of *o*-toluidine and 4,4′-methylene bis(2-methylaniline) in inducing bladder cancer in man. *Environ. Res.*, *27*, 241-254

[2]*IARC Monographs*, *4*, 73-77, 1974

[3]Stula, E.F., Sherman, H., Zapp, J.A., Jr & Clayton, J.W., Jr (1975) Experimental neoplasia in rats from oral administration of 3,3′-dichlorobenzidine, 4,4′-methylene-bis(2-chloroaniline), and 4,4′-methylene-bis(2-methylaniline). *Toxicol. appl. Pharmacol.*, *31*, 159-176

[4]Stula, E.F., Barnes, J.R., Sherman, H., Reinhardt, C.F. & Zapp, J.A., Jr (1978) Liver and lung tumors in dogs from 4,4′-methylene-bis(2-methylaniline). *J. environ. Pathol. Toxicol.*, *1*, 339-356