

N-Methylpyrrolidone (1-Methyl-2-pyrrolidinone)

N-Methylpyrrolidone is an industrial solvent which is widely used in industrial applications, such as petroleum refining, the formulation of pesticides, and as an agent in some veterinary pharmaceutical products. It is also used in paint strippers sold to consumers and in industrial cleaning applications. Consumers and workers are exposed.

N-Methylpyrrolidone passed the animal data screen, underwent a preliminary toxicological evaluation, and is being brought to the Carcinogen Identification Committee for consultation. This is a compilation of the relevant studies identified during the preliminary toxicological evaluation.

Epidemiological data

No cancer epidemiology studies were identified.

Animal carcinogenicity data

- Long-term diet studies: Malley *et al.* (2001)
 - 2-year diet studies in male and female CrI:CD (SD)BR rats
 - *No treatment-related findings in males or females*
 - 18-month diet studies in male and female B6C3F1/CrI BR mice
 - *Increase in hepatocellular adenoma and carcinoma (by pair-wise comparison and by trend) in males*
 - *Increase in hepatocellular adenoma or carcinoma (by trend) and adenoma and carcinoma combined (by pairwise comparison and trend) in females*
- Long-term inhalation studies
 - 2-year studies in male and female Charles River CD rats: Lee *et al.* (1987)
 - *No treatment-related findings in males or females*

Other relevant data

- Genotoxicity: Engelhardt (1993)
 - Mouse micronucleus test (*negative*)
 - Chromosomal aberrations in Chinese hamster bone marrow test (*negative*)
 - Mutagenicity in *Salmonella typhimurium* tester strains TA97, TA98, TA100, TA1537, TA2638, UTH8413, UTH8414 mutation assay (*negative*)

- Mutagenicity in *Salmonella typhimurium* tester strains TA102, TA104 (*equivocal*)
- Mouse lymphoma L5178 Y cell line (*negative*)
- Bone marrow chromosome aberration in Chinese hamsters *in vivo* (*negative*)
- Micronuclei in NMRI mice (*negative*)
- Dominant lethal test in NMR1 mice (*negative*)
- Unscheduled DNA synthesis in rat primary hepatocytes (*negative*)
- Aneuploidy in *Saccharomyces cerevisiae* (*positive*)

References¹

Engelhardt G, Fleig, H (1993). 1-methyl-2-pyrrolidinone (NMP) does not induce structural and numerical chromosomal aberrations *in vivo*. *Mutat Res* **298**:149-155.

Lee KP, Chromey NC, Culik R, Branes JR, Schneider PW (1987). Toxicity of N-Methyl-2-pyrrolidone (NMP): Teratogenic, subchronic, and two-year inhalation studies. *Fund Appl Tox* **9**:222-235.

Malley A, Kennedy GL, Elliot GS, Slone TW, Mellert W, Deckhardt K, Kuttler K, Hildebrand B, Banton MI, Parod RJ, Griffiths JC (2001). Chronic toxicity and oncogenicity of N-methylpyrrolidone (NMP) in rats and mice by dietary administration. *Drug ChemTox* **24**(4):315-338.

¹ Excerpts or the complete publication have been provided to members of the Carcinogen Identification Committee, in the order in which they are discussed in this document.