Vinylidene Chloride

Vinylidene chloride (1,1-dichloroethylene) is used extensively as a monomeric intermediate in the production of polymers and fibers. These include polyvinylidene chloride resins, modacrylic fibers, and films for food packaging. Exposure is expected to workers involved in the manufacture of the monomer and polymers and in the processing of polymers and fibers. It is unclear whether there is any exposure to the general population.

Vinylidene chloride 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

- Cohort studies
  - Occupational study: Ott et al. (1976)
  - Reviews: Apfeldorf and Infante (1981)

Animal carcinogenicity data

- Long-term inhalation studies in mice
  - Male and female Swiss mice (52-week treatment period, and then observed up to week 121): Maltoni et al. (1984, see Tables 2, 23-25, and Appendix)
  - 12-month studies in male and female CD-1 mice: Lee et al. (1977, 1978), as described by IARC (1986)

- Long-term inhalation studies in rats
  - Male and female Sprague-Dawley rats (52-week treatment period, and then observed up to week 137): Cotti et al. (1988), Maltoni et al. (1984, see Tables 8-12)
  - 18-month studies in male and female Sprague-Dawley rats: Quast et al. (1986)
  - 12-month studies in male and female CD rats: Lee et al. (1977, 1978), as described by IARC (1986)

- Long-term inhalation studies in hamsters
  - Male and female Chinese hamsters (52-week treatment period, and then observed up to week 164): Maltoni et al. (1984, see Tables 5, 26)

- Long-term gavage studies in mice
  - Two-year gavage studies in male and female B6C3F1 mice: NTP (1982)

- Long term-gavage studies in rats
Male and female Sprague-Dawley rats (High and low dose studies with a 52-week treatment period, and then observed up to week 147): Maltoni et al. (1984, see Tables 3-4, 13-22)

Male and female BDIV rats (one dose on gestation day 17 + weekly dosing from weaning to natural death): Ponomarkov and Tomatis (1980), as described by IARC (1986)

- Chronic drinking water studies in rats
  - Two-year drinking water studies in male and female Sprague-Dawley rats: Quast et al. (1983)

- Subcutaneous studies in mice
  - Female Ha:ICR Swiss mice (once per week for 78 weeks): Van Duuren et al. (1979), as described by IARC (1986)

- Dermal studies in mice
  - Female Ha:ICR Swiss mice (three times per week for up to 84 weeks): Van Duuren et al. (1979), as described by IARC (1986)

- Tumor initiation study
  - Female Ha:ICR Swiss mice (single dermal application, followed two weeks later with thrice-weekly applications of 12-0-tetradecanoylphorbol 13-acetate for up to 82 weeks): Van Duuren et al. (1979), as described by IARC (1986)
    - Other relevant data

  - Genotoxicity data
    - Salmonella mutagenicity assay: reviewed in IARC (1986, pp. 211-212)
    - E. coli mutagenicity assay: ibid
    - Saccharomyces point mutation assay: ibid
    - Chinese hamster V79 mutation assay: ibid
    - Chinese hamster assay for chromosomal aberrations: ibid
    - Assays for DNA binding and unscheduled DNA synthesis in CD-1 mice: ibid
    - Dominant lethal mutation assay in CD-1 mice: ibid

  - Structure activity considerations
    - Structurally similar to the Proposition 65 carcinogens vinyl chloride and vinyl bromide.

Review

- IARC (1986)
References


National Toxicology Program (NTP, 1982) NTP Technical Report on the Carcinogenesis Bioassay of Vinylidene Chloride (CAS No. 75-35-4) in F344/N Rats and B6C3F1 Mice (Gavage Study). National Toxicology Program, National Institutes of Health. NIH Publication No. 82-1784.


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11 Copies of these listed references, as either the abstract, the relevant sections of the publication, or the complete publication, have been provided to members of the Carcinogen Identification Committee. These references have been provided in the order in which they are discussed in this document.