

Pentachloronitrobenzene

Pentachloronitrobenzene is a fungicide mainly used in California in landscape maintenance by professional applicators. It is applied to lawns only in certain limited applications such as industrial parks or golf courses, but not in residential settings. Food crop use in California is very limited, mainly in Brussels sprouts (about 4,400 lb in 2009). U.S. EPA (2006) reported that it is used in food crops such as broccoli, Brussels sprouts, barley, oats, rice and wheat. Some tolerance levels have been established. The public may be exposed through contact with lawns in golf courses and industrial parks, or consuming foods imported into the state. Workers may be exposed during application.

Pentachloronitrobenzene 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 studies in mice
 - 78-week studies in male and female C57BL/6xC3H/Anf mice by gavage on days 7-28; in the diet weeks 4-78: Innes *et al.* (1969)
 - *Increase in combined hepatocellular adenoma and carcinoma (by pairwise comparison) in females*
 - *No treatment-related tumor findings in males*
 - 78-week studies in male and female C57BL/6xAKR mice by gavage on days 7-28; in the diet weeks 4-78: Innes *et al.* (1969)
 - *Increase in combined hepatocellular adenoma and carcinoma (by pairwise comparison) in males*
 - *No treatment-related tumor findings in females*
 - 78-week feeding studies in male and female B6C3F₁ mice: NCI (1978)
 - *No treatment-related tumor findings in males or females*
 - 104-week feeding studies in male and female Swiss SPF mice: International Programme on Chemical Safety (1984)
 - *Increase in subcutaneous fibrosarcoma (by pairwise comparison) in females*
 - *No treatment-related tumor findings in males*
 - 103-week feeding studies in male and female B6C3F₁ mice: NTP (1987)

- *No treatment-related tumor findings in males or females*
- Long-term diet studies in rats
 - 78-week feeding studies in male and female Osborne-Mendel rats: NCI (1978)
 - *No treatment-related tumor findings in males or females*
 - 104-week studies in male and female Wistar rats: International Programme on Chemical Safety (1984)
 - *No treatment-related tumor findings in males or females*
 - Two-year studies in male and female Charles river (CD) rats: U.S. EPA (2003)
 - *Increase in thyroid follicular cell adenoma, carcinoma and combined adenoma and carcinoma (by pairwise comparison and trend) in males*
 - *Increase in thyroid follicular cell adenoma, carcinoma and combined adenoma and carcinoma (by trend) in females*

Other relevant data

- Genotoxicity
 - Chromosomal nondisjunction in *Aspergillus nidulans* (*positive*): Morpurgo *et al.* (1979)
 - DNA damage test in *Salmonella typhimurium* (*positive*): Rashid and Mumma (1986)
 - DNA damage tests in *E. coli* (*negative*): Rashid and Mumma (1986)
 - *Salmonella typhimurium* reverse gene mutation assay (*negative*): NTP (1987)
 - L5178Y mouse lymphoma cell forward gene mutation assay (*negative*): NTP (1987)
 - *In vitro* chromosomal aberration assay in Chinese hamster ovary (CHO) cells (*positive*): NTP (1987)
 - *In vitro* sister chromatid exchange (SCE) assay in CHO cells (*negative*): NTP (1987)
 - Review: NCI (1978)
 - Reverse gene mutation assay in a tryptophan-requiring strain of *E. coli* (*positive*)
 - *Drosophila* sex-linked lethal mutation assay (*negative*)
 - Mouse host-mediated mutation assays (*negative*)

Reviews

- IARC (1974)

References¹

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- National Cancer Institute (NCI, 1978). *Bioassay of pentachloronitrobenzene for possible carcinogenicity*. CAS No. 92-68-8. NCI Technical Report Series No. 61. DHEW Publications No. (NIH) 78-1311), Washington DC, US Government Printing Office.
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- Rashid KA, Mumma RO (1986). Screening pesticides for their ability to damage bacterial DNA. *J Environ Sci Health Part B: Pesticides Food Contam Agricultural Wastes* **21**:319-334.
- U.S. Environmental Protection Agency (U.S. EPA, 2003). PCNB (PC Code 056502) – Toxicology Disciplinary Chapter for the Reregistration Eligibility Decision (RED). December 15, 2003, Health Effects Division, Office of Prevention, Pesticides and Toxic Substances.
- U.S. Environmental Protection Agency (U.S. EPA, 2006). Reregistration Eligibility decision for Pentachloronitrobenzene. List A. Case No. 0128. EPA-HQ-OPP-2004-0202-0057. Office of Prevention, Pesticides and Toxic Substances.

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.