

Decabromodiphenyl ether (DecaBDE; Decabromobiphenyl oxide)

Decabromodiphenyl ether (DecaBDE), also known as decabromobiphenyl oxide, is a flame retardant that has been used in thermoplastics such as those used in computer cases, keyboards and other computer parts, building materials, and upholstered furniture. DecaBDE is a polybrominated diphenyl ether (PBDE). DecaBDE, as other PBDEs, is prevalent in the environment and in tissues of humans and animals.

DecaBDE 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

- 103-week feeding studies
 - Male and female F344/N rats: NTP (1986)
 - *Increases in liver neoplastic nodules and pancreatic acinar cell adenomas in males and in liver neoplastic nodules and carcinomas combined in females (by pairwise comparison and trend)*
 - Male and female B6C3F₁ mice: NTP (1986)
 - *Increase in hepatocellular adenomas and carcinomas combined in males (by pairwise comparison)*
 - *No treatment-related tumor findings in females*
 - Reviews of above studies:
 - U.S. EPA (2008): *Group C (possible human carcinogen) because of “suggestive evidence of carcinogenic potential” based on neoplastic nodules in male and female rats and hepatocellular adenomas and carcinomas (combined) in male mice.*
 - IARC (1999): *There is limited evidence in experimental animals.*

Other relevant data

- Genotoxicity
 - Review: IARC (1999)

- Mutagenicity in *Salmonella typhimurium* reverse mutation assays (*negative*) and mouse lymphoma cells (*negative*)
 - Sister chromatid exchange in Chinese hamster ovary cells (*negative*)
 - Chromosomal aberrations in Chinese hamster ovary cells (*negative*)
- Structure activity considerations
 - Broad structural similarities to other polyhalogenated persistent organic pollutants including PCBs, DDT and TCDD: Hooper and McDonald (2000)

Reviews

- IARC (1999)
- U.S. EPA (2008, pp. 22-28)

References¹

Hooper K, McDonald TA (2000). The PBDEs: An emerging environmental challenge and another reason for breast-milk monitoring programs. *Environ Health Perspect* **108**(5):387-392.

International Agency for Research on Cancer (IARC, 1999). IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Re-evaluation of some organic chemicals, hydrazine and hydrogen peroxide (part 3), Volume 48, IARC, Lyon, France. pp. 1365-1368.

National Toxicology Program (NTP, 1986). NTP Technical Report on the Toxicology and Carcinogenesis Studies of Decabromodiphenyl Oxide (CAS No. 1163-19-5) in F344/N Rats and B6C3F1 Mice (Feed Studies), NTP TR 309, NIH Publication No. 86-2565, National Institutes of Health.

U.S. Environmental Protection Agency (U.S. EPA, 2008). Toxicological Review of Decabromodiphenyl Ether (BDE-209) (CAS No. 1163-19-5) In support of summary information on the Integrated Risk Information System (IRIS), June 2008, Washington, DC. pp. 22-28.

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.