

Anthanthrene

Anthanthrene, also called dibenzo(*cd,jk*)pyrene, is a product of incomplete combustion. This polycyclic aromatic hydrocarbon is commonly found in cigarette smoke and engine exhaust. Anthanthrene is present in food and water that has been contaminated with combustion products, and in ambient air.

Anthanthrene 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

- Dermal studies in mice
 - Female Swiss mice (twice a week for 30 weeks and observed for an additional 40 weeks): Cavalieri *et al.* (1977)
- Intrapulmonary implantation studies in rats
 - Female Osborne-Mendel rats (implantation at three months of age, observed for life): Deutsch-Wenzel *et al.* (1983)
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- Intra-mammillary injection studies in rats
 - Female Sprague-Dawley rats (injection into mammary glands at eight-weeks of age, observed for 40 weeks): Cavalieri *et al.* (1989)
- Tumor-initiating studies in mice
 - Female SENCAR mice (single dermal application of anthanthrene, followed after one week with dermal applications of tetradecanoylphorbol acetate (twice a week for 25 weeks): Cavalieri *et al.* (1989)

Other relevant data

- Genotoxicity
 - *Salmonella* mutagenicity assays: Andrews *et al.* (1978)
 - Binding to DNA: Cavalieri *et al.* (1983)
 - Reviews: IARC (1983, p. 99)
- Structural activity considerations
 - Structurally similar to other six-ring polycyclic aromatic hydrocarbons that are listed under Proposition 65 as carcinogens, including

benzo[a]pyrene, dibenzo[a,e]pyrene, dibenzo[a,h]pyrene,
dibenzo[a,i]pyrene and dibenzo[a,l]pyrene.

Reviews

- IARC (1983; 1987)

References¹

Andrews AW, Thibault LH, Lijinsky W (1978). The relationship between carcinogenicity and mutagenicity of some polynuclear hydrocarbons. *Mutation Research* **51**:311-318.

Cavalieri E, Mailander P, Pelfrene A (1977). Carcinogenic activity of anthanthrene on mouse skin. *Z Krebsforsch* **89**:113-118.

Cavalieri EL, Rogan EG, Roth RW, Saugier RK, Hakam A (1983). The relationship between ionization potential and horseradish peroxidase/hydrogen peroxide-catalyzed binding of aromatic hydrocarbons to DNA. *Chem-Biol Interact* **47**:87-109.

Cavalieri EL, Rogan EG, Higginbotham S, Cremonesi P, Salmasi S (1989). Tumor-initiating activity in mouse skin and carcinogenicity in rat mammary gland of dibenzo[a]pyrenes: the very potent environmental carcinogen dibenzo[a,l]pyrene. *Cancer Res Clin Oncol* **115**:67-72.

Deutsch-Wenzel RP, Brune H, Grimmer G, Dettbarn G, Misfeld J (1983). Experimental studies in rat lungs on the carcinogenicity and dose-response relationships of eight frequently occurring environmental polycyclic aromatic hydrocarbons. *J Natl Cancer Inst* **71**:539-544.

International Agency for Research on Cancer (IARC, 1983). *IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: Polynuclear aromatic compounds, part I, Chemical, environmental and experimental data*. Vol. 32, pp. 95-104. IARC, World Health Organization, Lyon, France.

International Agency for Research on Cancer (IARC, 1987). *IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans. Overall evaluation of carcinogenicity: An updating of IARC Monographs Volume 1 to 42*. Supplement 7, p. 57. IARC, World Health Organization, Lyon, France.

¹ 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.