4-Dimethylaminoazobenzene

60-11-7

Hazard Summary

4–Dimethylaminoazobenzene is used as a dye for coloring polishes, wax products, and soap. Acute (short-term) dermal exposure to 4–dimethylaminoazobenzene may result in contact dermatitis in humans. No information is available on the chronic (long–term), reproductive, developmental, or carcinogenic effects of 4–dimethylaminoazobenzene in humans. Animal studies have reported birth defects in the offspring of mice exposed to 4–dimethylaminoazobenzene and tumors of the lung, liver, and bladder from oral exposure to 4–dimethylaminoazobenzene. EPA has not classified 4–dimethylaminoazobenzene for carcinogenicity. The International Agency for Research on Cancer (IARC) has classified 4–dimethylaminoazobenzene as a Group 2B, possibly carcinogenic to humans.

Please Note: The main sources of information for this fact sheet is the Hazardous Substances Data Bank (HSDB) (1), a database of summaries of peer-reviewed literature, and the International Agency for Research on Cancer (IARC) monographs on chemicals carcinogenic to man. (4)

Uses

- 4-Dimethylaminoazobenzene was used as a dye for coloring polishes and other wax products, polystyrene, soap, and as a pH indicator. (4)
- 4-Dimethylaminoazobenzene is not currently produced or used commercially in the U.S. (3)

Sources and Potential Exposure

 Occupational exposure (primarily dermal) has occurred for those workers who manufacture or use azo dyes. (1)

Assessing Personal Exposure

• No information is available on the assessment of personal exposure to 4-dimethylaminoazobenzene.

Health Hazard Information

Acute Effects:

- Contact dermatitis has been observed in workers who handled 4-dimethylaminoazobenzene. (1)
- Tests involving acute exposure of rats have shown 4-dimethylaminoazobenzene to have high acute toxicity from oral exposure. (2)

Chronic Effects (Noncancer):

- No information is available on the chronic effects of 4-dimethylaminoazobenzene in humans or animals.
- EPA has not established a Reference Concentration (RfC) or a Reference Dose (RfD) for 4-dimethylaminoazobenzene.

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of 4-dimethylaminoazobenzene in humans.
- Animal studies have reported birth defects in the offspring of mice exposed to 4-

Cancer Risk:

- No information is available on the carcinogenic effects of 4-dimethylaminoazobenzene in humans.
- Animal studies have reported tumors of the lung, liver, and bladder from oral exposure to 4-dimethylaminoazobenzene. (1,4,5)
- EPA has not classified 4-dimethylaminoazobenzene for carcinogenicity. (1)
- IARC has classified 4-dimethylaminoazobenzene as a Group 2B, possibly carcinogenic to humans. (4)
- The Department of Health and Human Services (DHHS) considers 4-dimethylaminoazobenzene to be reasonably anticipated to be a human carcinogen. (3)
- The California Environmental Protection Agency (CalEPA) has calculated an oral cancer slope factor of 4.6 (mg/kg/d) and an inhalation unit risk factor of 0.0013 x 10 $(\mu g/m)$. (6)

Physical Properties

- 4-Dimethylaminoazobenzene exists as yellowish, crystalline leaflets. (1)
- The chemical formula for 4-dimethylaminoazobenzene is $C_{14}^{H}_{15}^{N}_{3}$, and the molecular weight is 225.3 g/mol. (1)
- The vapor pressure for 4-dimethylaminoazobenzene is 3.3×10^{-7} mm Hg at 25 °C, and it has a log octanol/water partition coefficient (log K ow of 4.58. (1)
- 4-Dimethylaminoazobenzene is insoluble in water. (4)

Note: There are very few health numbers or regulatory/advisory numbers for 4-dimethylaminoazobenzene; thus, a graph has not been prepared for this compound. The health information cited in this fact sheet was obtained in December 1999.

Conversion Factors:

To convert concentrations in air (at 25°C) from ppm to mg/m^3 : $mg/m^3 = (ppm) \times (molecular weight of the compound)/(24.45). For 4-dimethylaminoazobenzene: 1 ppm = 9.2 mg/m³.$

Summary created in April 1992, updated January 2000

References

- 1. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
- 2. U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
- 3. U.S. Department of Health and Human Services. 8th Report on Carcinogens. National Toxicology Program, National Institute of Environmental Health Sciences, Research Triangle Park, NC. 1998.
- 4. International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man. Volume 8. World Health Organization, Lyon. 1975.
- 5. M. Sittig. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 2nd ed. Noyes Publications, Park Ridge, NJ. 1985.
- 6. California Environmental Protection Agency (CalEPA). Air Toxics Hot Spots Program Risk Assessment Guidelines: Part II. Technical Support Document for Describing Available Cancer Potency Factors. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1999.