

4-Nitrobiphenyl

92-93-3

Hazard Summary

4-Nitrobiphenyl is no longer manufactured or used in the United States. Limited information is available on the health effects of 4-nitrobiphenyl. Acute (short-term) exposure to 4-nitrobiphenyl in humans results in irritation of the eyes, mucous membranes, and respiratory tract, and headache, nausea, vomiting, and fatigue. Chronic (long-term) exposure to high concentrations of 4-nitrobiphenyl in workers has resulted in effects on the peripheral and central nervous systems and the liver and kidney. No information is available on the reproductive, developmental, or carcinogenic effects of 4-nitrobiphenyl in humans. EPA has not classified 4-nitrobiphenyl for carcinogenicity.

Please Note: The main sources of information for this fact sheet are 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. (4) Other secondary sources include the Registry of Toxic Effects of Chemical Substances (RTECS) (2), a database of toxic effects that are not peer reviewed, and the Handbook of Toxic and Hazardous Chemicals and Carcinogens. (3)

Uses

- 4-Nitrobiphenyl is no longer manufactured, imported, used, or sold in the United States. (1)

Sources and Potential Exposure

- Since 4-nitrobiphenyl is no longer manufactured or used in the United States, the only exposure to the chemical is from hazardous waste which was disposed of in past years. (1)

Assessing Personal Exposure

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

Health Hazard Information

Acute Effects:

- 4-Nitrobiphenyl irritates the eyes, mucous membranes, and respiratory tract from acute exposure in humans. Other effects from acute exposure include headache, nausea, vomiting, and fatigue. (1) Tests involving acute exposure of rats and rabbits have shown 4-nitrobiphenyl to have moderate acute toxicity from oral exposure. (2)

Chronic Effects (Noncancer):

- Workers chronically exposed to high concentrations of 4-nitrobiphenyl have reported effects on the peripheral and central nervous systems and the liver and kidney. (1)
- No information is available on the chronic effects of 4-nitrobiphenyl in animals.
- EPA has not established a Reference Concentration (RfC) or a Reference Dose (RfD) for 4-nitrobiphenyl.

Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of 4-nitrobiphenyl in humans or animals.

Cancer Risk:

- No information is available on the carcinogenic effects of 4-nitrobiphenyl in humans. However, 4-nitrobiphenyl has been used in the production of 4-aminobiphenyl, which is a known human bladder carcinogen. (1,4)
- In one animal study, oral exposure to 4-nitrobiphenyl resulted in bladder tumors in dogs. (1,4)
- EPA has not classified 4-nitrobiphenyl for carcinogenicity.
- IARC has classified 4-nitrobiphenyl as a Group 3; the chemical is not classifiable as to its carcinogenicity to humans. (4)

Physical Properties

- 4-Nitrobiphenyl exists as yellow or white needles with a sweetish odor. (3)
- The chemical formula for 4-nitrobiphenyl is $C_{12}H_9NO_2$, and the molecular weight is 199.22 g/mol. (3)
- The log octanol/water partition coefficient ($\log K_{ow}$) for 4-nitrobiphenyl is 3.77. (3)

Note: There are very few health numbers or regulatory/advisory numbers for 4-nitrobiphenyl; 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 : $mg/m^3 = (ppm) \times (\text{molecular weight of the compound}) / (24.45)$. For 4-nitrobiphenyl: 1 ppm = 8.15 mg/m^3 .

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, Bethesda, National Library of Medicine, 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. M. Sittig. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 2nd ed. Noyes Publications, Park Ridge, NJ. 1985.
4. International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man. Volume 4. World Health Organization, Lyon. 1974.