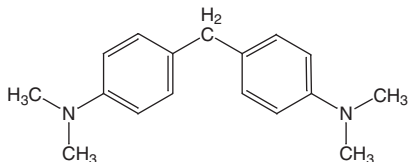


4,4'-Methylenebis(*N,N*-Dimethyl)Benzenamine

CAS No. 101-61-1

Reasonably anticipated to be a human carcinogen
First Listed in the *Third Annual Report on Carcinogens* (1983)



Carcinogenicity

4,4'-Methylenebis(*N,N*-dimethyl)benzenamine is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals. When administered in the diet, the chemical induced hepatocellular adenomas and carcinomas in mice of both sexes and thyroid follicular cell adenomas and carcinomas in rats of both sexes (NCI 1979).

No data were available to evaluate the carcinogenicity of 4,4'-methylenebis(*N,N*-dimethyl)benzenamine in humans (IARC 1982).

Properties

4,4'-Methylenebis(*N,N*-dimethyl)benzenamine, commonly known as Michler's base, occurs as yellow leaflets or glistening plates. Its molecular weight is 254.4, it melts at 90°C to 91°C, and boils at 155°C to 157°C at 0.1 mm Hg. It is insoluble in water, slightly soluble in cold alcohol, and soluble in benzene, acids, diethyl ether, carbon disulfide, and hot alcohol (HSDB 2001).

Use

4,4'-Methylenebis(*N,N*-dimethyl)benzenamine is used as an intermediate in dye manufacture (e.g., basic yellow 2, basic orange 14, solvent yellow 34), as a chemical intermediate for its hydrochloride salt, and as an analytical reagent for lead (HSDB 2001).

Production

Commercial production of this chemical began in the early 1920s in the United States (IARC 1982). The U.S. produced approximately one million lb/yr between 1973 and 1977. More recent production data were not found; however, three U.S. manufacturers and six U.S. suppliers were identified (Chem Sources 2001, HSDB 2001).

Exposure

The primary routes of potential human exposure to 4,4'-methylenebis(*N,N*-dimethyl)benzenamine are inhalation and dermal contact. Although the compound is relatively nonvolatile, there is a potential for inhalation exposure to dust in the workplace. The potential for exposure to this chemical is greatest among workers in the dye and chemical manufacturing industries. The National Occupational Hazard Survey, conducted by NIOSH from 1972 to 1974, estimated that 1,563 workers were possibly exposed to this chemical in the workplace (NIOSH 1976). Skin contact with 4,4'-methylenebis(*N,N*-dimethyl)benzenamine may also occur, and it is possible that consumers using products colored with these dyes may be exposed to unknown quantities of the compound. Residual levels of the chemical may be present in the final consumer products. No industrial facilities have reported environmental releases of 4,4'-methylenebis(*N,N*-dimethyl)benzenamine to the EPA's Toxic Chemical Release Inventory (TRI) since 1997. Past releases reported to TRI included 8,400 lb in 1988, 10 lb in 1995, and 1 lb in 1996 (TRI99 2001).

Regulations

EPA

Emergency Planning and Community Right-To-Know Act
Toxics Release Inventory: Listed substance subject to reporting requirements

REFERENCES

- ChemSources. 2001. Chemical Sources International, Inc. <http://www.chemsources.com>.
 HSDB. 2001. Hazardous Substances Data Base. National Library of Medicine. <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>.
 IARC. 1982. Some Aromatic Amines, Anthraquinones and Nitroso Compounds and Inorganic Fluorides Used in Drinking Water and Dental Preparations. IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans, vol. 27. Lyon, France: International Agency for Research on Cancer. 341 pp.
 NCI. 1979. Bioassay of 4,4'-Methylenebis(*N,N*-dimethyl)benzenamine for Possible Carcinogenicity (CAS no. 106-61-1). Technical Report Series No 186. DHEW (NIH) Publication No. 78-1742. Bethesda, MD: National Institute of Health. 58 pp.
 NIOSH. 1976. National Occupational Hazard Survey (1972-74). Cincinnati, OH: Department of Health, Education and Welfare.
 TRI99. 2001. Toxic Chemical Release Inventory 1999. Data contained in the Toxic Chemical Release Inventory (TRI). National Library of Medicine. <http://www.epa.gov/triexplorer/>.