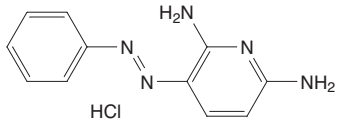
Phenazopyridine Hydrochloride

CAS No. 136-40-3

Reasonably anticipated to be a human carcinogen

First listed in the *Second Annual Report on Carcinogens* (1981)

Also known as Pyridium (a registered trademark of Warner Chilcott)



Carcinogenicity

Phenazopyridine hydrochloride is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity from studies in experimental animals.

Cancer Studies in Experimental Animals

Dietary exposure to phenazopyridine hydrochloride caused tumors in two rodent species and at two different tissue sites. In female mice, it caused benign and malignant liver tumors (hepatocellular adenoma and carcinoma). In rats of both sexes, it caused benign or malignant colorectal tumors (adenoma, adenocarcinoma, or sarcoma) (NCI 1978).

Cancer Studies in Humans

The data available from epidemiological studies are inadequate to evaluate the relationship between human cancer and exposure specifically to phenazopyridine hydrochloride.

Properties

Phenazopyridine hydrochloride is a heterocyclic aromatic azo compound that exists at room temperature as brick-red microcrystals with a slight violet luster (Akron 2009). It is slightly soluble in cold water, ethanol, and lanolin; soluble in boiling water, acetic acid, glycerol, ethylene glycol, and propylene glycol; and insoluble in acetone, benzene, chloroform, diethyl ether, and toluene (IARC 1975). Physical and chemical properties of phenazopyridine hydrochloride are listed in the following table.

Property	Information
Molecular weight	249.7[a]
Melting point	235°C[a]
Log K_{ow}	–0.30[b]
Water solubility	15.9 g/L at 25°C[b]
Vapor pressure	3.51×10^{-11} mm Hg at 25°C[b]

Sources: [a]IARC 1975, [b]ChemIDplus 2009.

Use

Phenazopyridine hydrochloride is used as an analgesic drug to reduce pain, burning, and discomfort associated with urinary tract infections or irritation. It has frequently been used in combination with sulfonamides and antibiotics (IARC 1975, 1980, HSDB 2009, Medline Plus 2009).

Production

Commercial production of phenazopyridine hydrochloride in the United States began in 1944. In the early 1970s, it was produced by two companies (IARC 1975). In 1979, estimated annual North American production was 22,000 to 110,000 lb (IARC 1980). In 2009, phenazopyridine hydrochloride was produced by seven manufacturers worldwide, including two U.S. manufacturers (SRI 2009), and was available from 21 suppliers, including 12 U.S. suppliers (ChemSources 2009). In 1978, U.S. imports of phenazopyridine hydrochloride totaled 15,400 lb (IARC 1980). No more recent data on U.S. production, imports, or exports were found.

Exposure

Exposure to phenazopyridine hydrochloride may occur through its ingestion as a drug or through dermal contact or inhalation of dust during its production, formulation, packaging, or administration (HSDB 2009, MedlinePlus 2009). Phenazopyridine hydrochloride has been marketed both as a prescription drug and as an over-the-counter product (FDA 2003). Oral tablets containing phenazopyridine hydrochloride in combination either with sulfamethoxazole, sulfmethoxazole and trimethoprim or with sulfisoxazole previously were available by prescription (FDA 2009). In 2010, about a dozen brands of over-the-counter products containing phenazopyridine were available (Drugs.com 2010). The National Occupational Exposure Survey (conducted from 1981 to 1983) estimated that 2,546 workers, including 1,328 women, potentially were exposed to phenazopyridine hydrochloride (NIOSH 1990).

Regulations

Consumer Product Safety Commission (CPSC)

Any orally administered prescription drug for human use requires child-resistant packaging.

Food and Drug Administration (FDA, an HHS agency)

As a prescription drug, phenazopyridine hydrochloride is subject to labeling and other requirements.

Guidelines

National Institute for Occupational Safety and Health (NIOSH, CDC, HHS)

A comprehensive set of guidelines has been established to prevent occupational exposures to hazardous drugs in health-care settings.

Occupational Safety and Health Administration (OSHA, Dept. of Labor)

A comprehensive set of guidelines has been established to prevent occupational exposures to hazardous drugs in health-care settings.

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