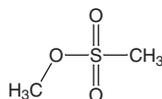


Methyl Methanesulfonate

CAS No. 66-27-3

Reasonably anticipated to be a human carcinogen
First Listed in the *Sixth Annual Report on Carcinogens* (1991)



Carcinogenicity

Methyl methanesulfonate is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC 1974, 1987, 1999). When administered in the drinking water, methyl methanesulfonate increased the incidence of lung tumors and thymic lymphomas in male mice. Whole-body inhalation exposure of male rats to methyl methanesulfonate resulted in nasal tumors in 47/80 treated animals versus 0/98 controls (IARC 1999). When administered by subcutaneous injection, methyl methanesulfonate induced local tumors in three male rats (two squamous cell carcinomas and one polymorphic cell sarcoma). In a similar study, methyl methanesulfonate induced three local sarcomas and one nephroblastoma in four male rats. When administered by a single intraperitoneal injection, methyl methanesulfonate induced one oligodendroglioma, one malignant neurofibroma, one astrocytoma, and a meningioma of the spinal cord in rats of both sexes. Prenatal exposure by a single intravenous injection on day 15 or day 21 of gestation induced five malignant neurinomas, one mixed glioma, and one oligodendroglioma in offspring of female rats.

No adequate human studies of the relationship between exposure to methyl methanesulfonate and human cancer have been reported (IARC 1974, 1987, 1999).

Properties

Methyl methanesulfonate is a colorless liquid with a boiling point of 203°C. It is soluble in water, dimethyl formamide, and propylene glycol and is slightly soluble in nonpolar solvents (HSDB 2001).

Use

Methyl methanesulfonate is used experimentally as a research chemical and as a catalyst in chemical synthesis (IARC 1974, 1999, Merck 1989, HSDB 2001). It has been tested as a cancer chemotherapeutic agent (HSDB 2001). The monoesters of methanesulfonic acid may be reversible insect and mammalian pest chemosterilants as well as possible human male contraceptives (IARC 1974).

Production

Production of methyl methanesulfonate is limited to research purposes (IARC 1974, 1999). Methyl methanesulfonate is not produced commercially in the United States, and no import and export data were available (IARC 1999, HSDB 2001). Chem Sources (2001) identified six U.S. suppliers of methyl methanesulfonate.

Exposure

Exposure to methyl methanesulfonate appears to be limited to laboratory research personnel. If released to the environment, it will hydrolyze rapidly, and it has a vapor phase half-life of 69 days (HSDB 2001).

Potential exposure to the general population exists if methyl methanesulfonate is approved for the production of chemosterilants for insects and mammalian pests or as a human male contraceptive or cancer chemotherapeutic agent. Methyl methanesulfonate is not known to occur in nature (IARC 1974).

Regulations

EPA

Resource Conservation and Recovery Act

Listed as a Hazardous Constituent of Waste

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