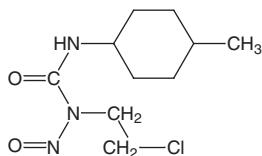


# 1-(2-Chloroethyl)-3-(4-Methylcyclohexyl)-1-Nitrosourea

## CAS No. 13909-09-6

Known to be a human carcinogen

First Listed in the *Sixth Annual Report on Carcinogens* (1991)



### Carcinogenicity

1-(2-Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea (MethylCCNU) is *known to be a human carcinogen* based on sufficient evidence of carcinogenicity in humans. The risk of developing leukemia or preleukemia following adjuvant treatment with methyl-CCNU during clinical trials was evaluated in 3,633 patients with gastrointestinal cancer (Boice *et al.* 1983). Fourteen cases of leukemic disorders were reported out of 2,067 patients given methyl-CCNU compared to only one case of acute nonlymphocytic leukemia out of 1,566 patients given other therapies (relative risk of over 12 fold). A strong dose-response relationship was shown in a later report; a relative risk of about 40 fold, adjusted for survival time, was found for patients treated with the highest dose of methyl-CCNU (IARC 1987).

Methyl-CCNU was tested for carcinogenicity by repeated intraperitoneal injection in rats and mice (Weisburger 1977). The compound increased the incidence of total tumors in rats and slightly increased the incidence of leukemia and lymphosarcomas in female mice. When administered by intravenous injection, methyl-CCNU induced lung tumors in rats. IARC (1987) concluded that there is limited evidence for the carcinogenicity of methyl-CCNU in experimental animals.

### Properties

Methyl-CCNU is a nitrosourea alkylating agent (Chabner *et al.* 2001) that occurs as a light yellow powder with a molecular weight of 247.8 and a melting point of 64°C. It is stable under normal conditions but should be protected from moisture. It is incompatible with strong oxidizing agents and strong bases. Hazardous combustion or decomposition products include carbon monoxide, hydrochloric acid, and nitrogen oxides (Sigma 2000).

### Use

Methyl-CCNU is an investigational drug used in chemotherapy to treat several types of cancers, including some brain cancers (ACS 2000). It also has been used to treat cancers of the lung and digestive tract (Boice *et al.* 1983).

### Production

No production, import, or export values for methyl-CCNU were available. Three U.S. suppliers were identified (ChemSources 2003).

### Exposure

Cancer patients may be exposed during chemotherapy. Doses vary depending on the type of cancer and body weight of the individual (ACS 2000). The typical oral dose is 125 to 200 mg/m<sup>2</sup> body surface area and is repeated every six weeks (Parfitt 1999). The National Occupational Exposure Survey (NOES), conducted by the National Institute for Occupational Safety and Health (NIOSH) from 1981 to 1983, estimated that 229 total workers, including 82 women, were potentially occupationally exposed to methyl-CCNU (RTECS 2003).

### Regulations

#### CPSC

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

#### FDA

MethylCCNU is a prescription drug subject to labeling and other requirements

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