
ENVIRONMENTAL Fact Sheet



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Chloromethane: Health Information Summary

Chloromethane is usually present in the environment as a gas, but also can exist as a clear liquid with a slightly sweet odor. Natural sources of chloromethane include its production by microbes, chemical reactions in the ocean, and generation by forest fires. Human activities that produce chloromethane are its synthesis for industrial use, its creation as a byproduct of water chlorination, and as a byproduct from burning wood, coal, and plastics. Refrigerators greater than 30 years old may contain chloromethane as the coolant.

Everyone is likely exposed to low levels of chloromethane because of its presence in the air due to natural processes and as a by product of the chlorination of drinking water supplies. Air concentrations of chloromethane measured in several U.S. cities averaged slightly below 1 part per billion (ppb).

Health Effects

Exposure and Metabolism

Chloromethane is readily absorbed from the lungs, although the percentage absorbed is not known. There are no studies on oral or dermal absorption. Chloromethane is unlikely to build up in the body because it is rapidly eliminated.

Short-Term (Acute) Effects

Exposure to very high concentrations of chloromethane that would only result from accidental releases can cause symptoms of central nervous system (CNS) depression such as headache, dizziness, impaired vision, nausea, vomiting, tremors, convulsions, and coma. Exposures to concentrations of chloromethane high enough to cause these effects are normally not experienced in the environment. These levels could be potentially found in industrial settings.

Long-Term (Chronic) Effects

Some humans exposed to very high levels from industrial releases or refrigerator leaks not only experienced acute CNS symptoms, but their symptoms also lasted for several months and included depression and other personality changes.

Long-term inhalation exposure to chloromethane in animal studies caused degenerative brain lesions. Toxicity to the liver and kidney were also observed in animal studies.

Carcinogenic (Cancer-Causing) Effects

Human studies of chloromethane's carcinogenic potential have been unable to find an association between exposure and an increase in cancer. One animal study with exposure via inhalation found an increase in kidney tumors in male mice. However, the manner that chloromethane is most likely to have acted to cause kidney tumors in mice may not be relevant to humans because of differences between humans and mice. Based on the minimal available evidence, the US Environmental Protection Agency has classified chloromethane's ability to cause cancer in humans as "cannot be determined".

Reproductive/Developmental Effects

No studies are known regarding reproductive or developmental effects in humans. In several animal studies in which exposure was by inhalation, toxic effects to the male reproductive system were seen. In a study in which pregnant mice were exposed by inhalation to chloromethane, increases in malformations of the heart were observed in offspring; but only at concentrations high enough to also cause some toxic effects to the mothers.

Health Standards and Criteria

There is an EPA Lifetime Drinking Water Health Advisory (LHA) for chloromethane of 30 parts per billion (ppb). The LHA is based on an occupational study in which mild symptoms of neurological impairment were observed in workers. The state of New Hampshire has adopted this value as an appropriate ambient groundwater quality standard (AGQS).

The Occupational Safety and Health Administration (OSHA) has developed a permissible exposure limit or PEL for chloromethane in workplace air of 100 parts per million (ppm) averaged over eight hours.

For more information, please contact the DES Environmental Health Program, 29 Hazen Drive, Concord, NH 03302-0095; (603) 271-4608.

Suggested Reading and References

Casarett and Doull's Toxicology: The Basic Science of Poisons, Sixth Edition. Klaassen, C.D., ed. McGraw-Hill Publishing Co., Inc., New York, 2001.

Toxicological Profile for Chloromethane (Update). Agency for Toxic Substances and Disease Registry (ATSDR). Atlanta, GA. December, 1998. At: <http://www.atsdr.cdc.gov/toxprofiles/tp106.html>.

Toxicological Review of Methyl Chloride. U.S. Environmental Protection Agency. June, 2001. At: <http://www.epa.gov/ncea/iris/subst/1003.htm>.