PUBLIC HEALTH STATEMENT
BIS(CHLOROMETHYL) ETHER
CAS#: 542-88-1

Division of Toxicology **December 1989**

This Public Health Statement is the summary chapter from the Toxicological Profile for Bis(chloromethyl) ether. It is one in a series of Public Health Statements about hazardous substances and their health effects. A shorter version, the ToxFAQs™ is also available. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present. For more information, call the ATSDR Information Center at 1-888-422-8737.

1.1 WHAT IS BIS(CHLOROMETHYL) ETHER?

Bis(chloromethyl) ether (BCME) is a man-made chemical with a strong, unpleasant odor. It is a clear liquid at room temperature, but it readily evaporates into air. BCME undergoes chemical reactions easily, so it is broken down very rapidly when it comes into contact with water. Consequently, any BCME that might escape from a chemical plant or a chemical waste site into water or moist soil would be destroyed within a few minutes. BCME that escapes into air is also broken down by reacting with water and other chemicals, but this takes a few hours.

BCME was used in the past to make several types of polymers, resins and textiles. However, because BCME is believed to cause cancer in humans, these uses have been stopped. BCME is now used only in small amounts inside fully enclosed systems in chemical plants.

1.2 HOW MIGHT I BE EXPOSED TO BIS(CHLOROMETHYL) ETHER?

Since BCME has such limited use in the United States, chances for exposure to BCME are low. Some BCME can form as an impurity during the production of other chemicals, so exposure might occur in chemical plants that make or use these chemicals. Also, some BCME may exist in chemical waste sites, although this is not certain. Because BCME evaporates easily, the most likely way to be exposed to BCME in the workplace or around a waste site is by breathing air containing BCME vapors. However, information on levels of BCME which exist in air is not available.

1.3 HOW CAN BIS(CHLOROMETHYL) ETHER ENTER AND LEAVE MY BODY?

Because BCME is so quickly broken down by water, most BCME that contacts the body is quickly changed into other chemicals (formaldehyde and hydrochloric acid) before it passes through the outermost layer of cells contacted (e.g., the cells that line the nose, windpipe and lungs). Some BCME may enter into the blood or internal tissues, but this has not been studied and the amount may be too small to measure.

1.4 HOW CAN BIS(CHLOROMETHYL) ETHER AFFECT MY HEALTH?

Studies of people exposed to BCME in the workplace show that breathing of BCME vapors causes irritation to the nose, throat, and lungs. Contact with the liquid is also highly irritating to skin. In animals, breathing in high levels of BCME causes swelling and bleeding in the lung and can cause death. Workers exposed to BCME have been

shown to have a higher-than-expected incidence of lung cancer. This observation is supported by studies in animals which also show that BCME can cause cancer.

1.5 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO BIS(CHLOROMETHYL) ETHER?

Because BCME is broken down so rapidly in the body, there are no specific tests to determine if a human has been exposed to this compound. The only available medical tests are physical examination of the nose and throat, chest X-ray, and examination of the sputum for abnormal cell types. Unfortunately, these tests are not specific for this compound, and would reveal effects of the compound only after damage to the tissues had already occurred.

1.6 WHAT LEVELS OF EXPOSURE HAVE RESULTED IN HARMFUL HEALTH EFFECTS?

No information exists for either animals or humans on harmful health effects following oral exposure, but oral exposure is of little concern since BCME breaks down in water or moist foods and exposure is not likely by this route. Direct skin contact with even small amounts (less than a drop) of the liquid form of BCME causes severe skin irritation at the site of contact. It is not known what levels result in health effects in people from breathing BCME. In animals, lung injury has occurred from short and long-term exposure to levels of 0.7 parts per million (ppm) BCME and greater. An increased number of deaths due to nasal tumors was seen in animals exposed to BCME in air at levels of 0.1 ppm for 6 months.

1.7 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The EPA recommends that levels in lakes and streams should be limited to 0.0000038 parts per billion parts of water (0.0000038 ppb) to prevent possible health effects from drinking water or eating fish contaminated with bis(chloromethyl) ether. Any release to the environment greater than 10 pounds of bis(chloromethyl) ether must be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a limit of 1 ppb as the highest acceptable level in workplace air, and strict controls have been established to minimize exposure to this chemical.

The federal recommendations have been updated as of July 1999.

1.8 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns, please contact your community or state health or environmental quality department or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333

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Information line and technical assistance:

Phone: 888-422-8737
FAX: (770)-488-4178

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses resulting from exposure to hazardous substances.

To order toxicological profiles, contact:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800-553-6847 or 703-605-6000

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 1989. Toxicological profile for Bis(chloromethyl) ether. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.