

These documents are intended to raise your awareness of the health and safety hazards associated with the use, storage and disposal of Methyl Chloromethyl Ether, to provide you with information on how to protect yourself from these hazards and to provide you with the information regarding the regulations governing Methyl Chloromethyl Ether.

METHYL CHLOROMETHYL ETHER AWARENESS TRAINING

Substance: Methyl Chloromethyl Ether

CAS Registry Number : 107-30-2

Synonyms: Chlorodimethyl ether, Chloromethoxymethane, CMME, Dimethylchloroether, Methylchloromethyl ether

PROPERTIES

Chloromethyl methyl ether is a flammable, highly volatile, colorless liquid with an irritating odor. It is miscible with ethanol, ether, acetone, chloroform, and many other organic solvents. Chloromethyl methyl ether decomposes in water. A reaction with divalent metals forms a very reactive product. Chloromethyl methyl ether is a dangerous fire hazard when exposed to heat or flame and emits toxic fumes of chlorine when heated to decomposition.

USE

Chloromethyl methyl ether is used as a chemical intermediate, an alkylating agent and solvent in the manufacture of water repellents and ion-exchange resins, and in the synthesis of chloromethylated compounds.

EXPOSURE

NIOSH has set the recommended exposure limit (REL) for chloromethyl methyl ether at the lowest feasible concentration. OSHA issued an emergency temporary standard that prohibits operations in open vessels and requires exhaust fans, protective clothing and devices, and warning signs and labels. OSHA also regulates occupational exposure for chloromethyl methyl ether as a potential carcinogen. It further regulates the chemical under the Hazard Communication Standard and as chemical hazards in laboratories.

Regulations:

- IDLH: **Cancer**
- NIOSH REL: **Cancer**
- OSHA PEL: no PEL listed -see 1910.1006
- TLV: Listed as A2 which means that the chemical is a suspected human carcinogen.

Health effects: Numerous epidemiological studies and case reports from around the world have demonstrated that workers exposed to chloromethyl methyl ether and/or bis(chloromethyl)ether have an increased risk for lung cancer. Among heavily exposed workers, the relative risks are ten fold or more. Risks increase with duration and cumulative exposure. Histological evaluation indicates that exposure results primarily in

lung cancer of the small-cell type. Maximal relative risks appear to occur 15-20 years after first exposure, and latency is shortened among workers with heavier exposure.

The probable route of human exposure to chloromethyl methyl ether is inhalation. Symptoms may include severe skin, eyes, nose, throat, and respiratory tract irritation. Short-term exposure may cause pulmonary edema and pneumonia. Long-term inhalation exposure may cause chronic bronchitis. The United States Environmental Protection Agency (U.S. EPA) has not established an oral Reference Dose (RfD) for chloromethyl methyl ether, and a Reference Concentration (RfC) is under review. No information is available on the adverse developmental and reproductive effects of chloromethyl methyl ether in humans or animals.

Numerous case reports and epidemiological studies have reported increased incidences of respiratory cancer in workers occupationally exposed to chloromethyl methyl ether. The U.S. EPA has classified chloromethyl methyl ether as Group A: known human carcinogen. The International Agency for Research on Cancer has classified chloromethyl methyl ether as Group 1: human carcinogen.

Medical surveillance: Before an employee is assigned to enter a regulated area, a pre-assignment physical examination by a physician shall be provided. The examination shall include the personal history of the employee, family and occupational background, including genetic and environmental factors.

Authorized employees shall be provided periodic physical examinations, not less often than annually, following the pre-assignment examination.

In all physical examinations, the examining physician shall consider whether there exist conditions of increased risk, including reduced immunological competence, those undergoing treatment with steroids or cytotoxic agents, pregnancy and cigarette smoking.

Ways of Reducing Exposure:

- Enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
- Establish a regulated, marked area where chloromethyl methyl ether is handled, used, or stored.
- Wear protective work clothing such as gloves, lab coat, and safety goggles.
- Wash thoroughly and immediately after exposure to chloromethyl methyl ether and at the end of the work shift. Wash for at least 15 minutes with running water and mild soap.
- Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of chloromethyl methyl ether to potentially exposed workers.

Spill and working with chloromethyl methyl ether:

Access shall be restricted to authorized employees only.

Each operation shall be provided with continuous local exhaust ventilation so that air movement is always from ordinary work areas to the operation. Exhaust air shall not be discharged to regulated areas.

Employees shall be provided with, and required to wear, clean, full body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers and gloves prior to entering the regulated area. They will be required to wear and use a half-face, filter-type respirator for dusts, mists, and fumes.

Prior to each exit from a regulated area, employees shall be required to remove and leave protective clothing and equipment at the point of exit and, at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal.

Employees shall be required to wash hands, forearms, face and neck on each exit from the regulated area, and shower after the last exit of the day.

Dry sweeping and dry mopping are prohibited.

Signage:

Entrances to regulated areas shall be posted with signs bearing the legend:

CANCER-SUSPECT AGENT

AUTHORIZED PERSONNEL ONLY

Entrances to regulated areas containing operations shall be posted with signs bearing the legend:

CANCER-SUSPECT AGENT EXPOSED IN THIS AREA

IMPERVIOUS SUIT INCLUDING GLOVES, BOOTS, AND AIR-SUPPLIED HOOD
REQUIRED AT ALL TIMES

AUTHORIZED PERSONNEL ONLY

Appropriate signs and instructions shall be posted at the entrance to, and exit from, regulated areas, informing employees of the procedures that must be followed in entering and leaving a regulated area.

Training:

Training must include:

The nature of the carcinogenic hazards of Methyl Chloromethyl Ether (or its salts), including local and systemic toxicity;

The specific nature of the operation involving chloromethyl methyl ether which could result in exposure;

The purpose for, and application of, the medical surveillance program, including, as appropriate, methods of self-examination;

The purpose for, and application of, decontamination practices and purpose;

The purpose for, and significance of, emergency practices and procedures;

The employee's specific role in emergency procedures;

Specific information to aid the employee in recognition and evaluation of conditions and situations which may result in the release of Methyl Chloromethyl Ether;

The purpose for, and application of, specific first aid procedures and practices;

A review of this section at the employee's first training and indoctrination program and annually thereafter.

Emergency Procedures:

In a medical emergency, call 911, then 4111.

Inhalation:

Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment, use the buddy system). Remove source of contamination or move victim to fresh air. Obtain medical attention immediately.

Skin contact:

Under running water remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Obtain medical attention immediately. Completely decontaminate clothing, shoes and leather goods before re-use or discard.

Contact with Eyes:

Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15 minutes or until the chemical is removed, while holding eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain attention immediately.

Ingestion:

Rinse mouth and don't give anything to the victim to drink. Obtain medical attention immediately.

Before working with any chemical, review the Material Safety Data Sheet.