METHYLENE CHLORIDE
Substance safety data sheet and technical guidelines

Overview of OSHA Standard: On January 19, 1997, the Occupational Health and Safety Administration (OSHA) published a comprehensive health standard for methylene chloride (MC) which became effective April 10, 1997. The standard requires Yale University to provide information and evaluate exposures on representative users of MC. If exposures exceed OSHA’s permissible exposure limit (highly unlikely if one follows the guidance below), then exposed individuals must receive medical surveillance, work in a regulated area, and implement engineering controls and/or respiratory protection programs. A copy of the complete OSHA Standard and appendices, can be found at the OEHS web site [http://www.yale.edu/oehs/] or by requesting a copy by phone 737-2121.

Health Hazard Data: MC can affect the body if inhaled, swallowed, or by contact with the eyes or skin. MC is highly volatile and evaporates quickly at room temperature, which can result in elevated airborne concentrations. The MC odor threshold has been reported in the range of 25-320 ppm. It is considered to have poor warning properties.

• Effects from short-term exposure: MC is an anesthetic. Inhaling the vapor may cause confusion, light-headedness, staggering, unconsciousness, and even death. High vapor concentrations may also cause irritation of the eyes and respiratory tract. Exposure to MC may worsen the symptoms of angina (chest pains). Skin exposure to liquid MC may cause irritation, and if it remains on the skin, it may cause skin burns. Splashes of the chemical into the eyes may also cause irritation.

• Effects from long-term exposure: Laboratory animals studies suggest that MC causes cancer when inhaled at high concentrations for 6 hours per day, 5 days per week for a period of 2 years. MC exposure produced lung and liver tumors in mice and mammary tumors in rats. Although some human epidemiological studies show an association between occupational exposure to MC and increases in biliary (bile duct) cancer and brain cancer, others have not shown such a relationship. OSHA interprets these results to mean that there is some evidence to suggest that MC is a carcinogen. However, that evidence is not conclusive.

• Reporting signs and symptoms: You should inform your supervisor, the Employee Health Physician or the Office of Environmental Health and Safety (OEHS) if you develop any signs or health symptoms suggesting an overexposure to MC.

Precautions for Safe Use, Handling and Storage: Follow the guidance outlined in Section 3.6 of Yale University's Chemical Hygiene Plan (CHP) for regulated and particularly hazardous chemicals, i.e.

• Use and dispense MC within a chemical fume hood or other appropriate containment device (glove box).

• Store MC in a vented storage area if available. MC should be stored in an unbreakable, primary or secondary container or placed in a chemically resistant tray (to contain spills). Keep MC off open shelves or counters and restrict access to individuals who understand the chemical’s hazards and have been trained to use MC safely.

• Transport MC in public areas in durable outer containers.
• Procedures using large quantities of MC (greater than 0.1 liter) should be performed in designated areas. A chemical fume hood can be considered a designated area. Follow the Yale CHP requirements for designated areas. All designated areas for MC should be posted with a sign which reads:

**WARNING**

**DESIGNATED AREA FOR HANDLING THE FOLLOWING SUBSTANCES WITH HIGH, ACUTE OR CHRONIC TOXICITY:**

**Methylene Chloride-Carcinogen AUTHORIZED PERSONNEL ONLY**

• Laboratory equipment with the potential to release high vapor concentrations (greater than 25 ppm MC) should be locally exhausted or vented in a chemical fume hood.

**Personal Protective Equipment:** In addition to a laboratory coat and safety glasses, skin surfaces which might be exposed to MC should be covered with impermeable protective clothing. Gloves should be worn whenever transferring or handling MC. The level of eye protection should be based on splash risk and should include splash-proof goggles when liquid MC may contact the eyes. Remember, decontaminate and remove your personal protective equipment before leaving the laboratory, and if appropriate, the designated area for handling MC. Skin surfaces - hands, forearms, face and neck - should be washed immediately after handling MC.

**Personal Contamination and Spill Procedures:** If MC spills on your body or clothing, quickly remove all contaminated clothing and footwear and immediately flood the affected body area with water for at least 15 minutes. Remove jewelry to facilitate removal of any residual material. If splashed in the eyes, irrigate the eyeball and inner surface of the eyelid with plenty of cool water for at least 15 minutes using an eyewash. Forcibly hold eyelids open to ensure effective wash. Get medical attention promptly.

You can clean up a small spill of MC yourself (less than 0.1 liter). Don personal protective equipment (gloves, goggles, and labcoat), adsorb the spilled material using a spill kit or paper towels, and pick up the residue. Consider all residual chemical and cleanup materials (adsorbent, gloves, etc.) as hazardous waste. Place these materials in sealed containers (plastic bags) and store in chemical fume hood. Contact the OEHS to remove the waste (785-3551). If the spill is larger than 0.1 liter, call OEHS for assistance—Emergency Line (785-3555) between the hours of 8:30 a.m. to 5:00 p.m. or call University Police (111) at all other times.

**Methods of Waste Disposal:** MC is a listed hazardous waste. Chemical wastes from procedures using MC should be placed in containers, labeled, tagged, and disposed in accordance with the Environmental Services Section hazardous chemical waste program. The wastes should be stored in a satellite accumulation area until the waste is removed.