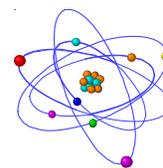


LABORATORY SAFETY FACT SHEET #27



Dichloromethane (also known as methylene chloride; CH₂Cl₂)

Exposure to dichloromethane (DM) – also known as methylene chloride - puts you at increased risk of developing cancer, adverse effects to the heart, central nervous system, liver and skin/eye irritation. Exposure may occur readily through inhalation or by skin absorption.

DM is one of few chemicals that has a **specific regulatory standard** written to protect workers. *Cal-OSHA Permissible Exposure Limits* for DM (see below) are low and violations of the standard can result in fines. To remain below the DM PEL, workers must always **work in a fume hood, glove box or with sealed containers** and in conjunction with adequate personal protective equipment. It is the **responsibility of the lab supervisor/PI** to ensure that all legally-required protections are in place and understood by their workers. Contact EH&S if your lab can not meet these requirements.

Exposure Hazards of Dichloromethane

Long-Term Effects of Exposure (Carcinogenicity)

Animal studies and the occurrence of disease in human work forces show a linkage between DM exposure and cancer. DM is listed as a **suspected human carcinogen** by the *International Agency on Research of Cancer* and the *National Toxicology Program*.

Short-Term Effects of Exposure

- *Inhalation* - DM is highly volatile and inhalation is therefore a major route of exposure. It can **irritate** the nose, throat and lungs. It also has an **anesthetic or narcotic effect**, causing people to feel intoxicated if overexposed. Higher exposures can cause a build-up of fluid in the lungs. A concentration of 50,000 ppm is immediately dangerous to life and health from asphyxiation.
- *Skin contact* - may irritate and burn. Can cause **dermatitis** (chapping, drying, rashes) on repeated contact with skin. May be **absorbed** through intact skin and readily passes through the blood-brain barrier to exert effects on the nervous system.
- *Eye contact* - can cause injuries ranging from transient discomfort and irritation to severe irritation with high exposures.

Cal-OSHA Legal Limits for Exposure

- *Permissible Exposure Limit (inhalation):* 25 ppm (8 hr time weighted average)
- *Short-term Exposure Limit (inhalation):* 125 ppm (15 minutes)
- *Action Level (inhalation):* 12.5 ppm (more than 30 days a year)

If EH&S, believes your exposure to DM may exceed these levels, UCSB must monitor your exposure level. If monitoring confirms that your exposure is above-limits, then a medical surveillance program must be made available to you at no cost, and/or your exposure must be reduced/eliminated.

Controlling Exposures

Engineering Controls

DM should *never* be used without adequate ventilation. It should always be used in a properly functioning **fume hood, glove box or in a sealed system.**

Protective Equipment and Clothing

- *Gloves* – the most common gloves found in campus labs/storerooms (nitrile, neoprene and latex) are **not recommended** for use with DM due to the ease with which it permeates through the glove material. The recommended gloves are “Silver Shield”, polyvinyl alcohol, Viton, or “Barrier” (available from vendors like Fisher Scientific). Some of these gloves have poor dexterity characteristics, but their utility can be increased by wearing a more dexterous glove over the inner glove.
- *Eyewear* - safety glasses or goggles should be worn as with any chemical
- *Respirator* – if a fume hood is available then a respirator is not needed. If a respirator is needed for special circumstances, prior to using one, you must first contact EH&S (x-8787) to enter the UCSB Respiratory Protection Program to satisfy current Cal-OSHA requirements.

Other Requirements

Material Safety Data Sheets (MSDS) - Per Cal-OSHA, chemical-users users must know what MSDS are, their relevance to health and safety and how to readily access them. These issues are all covered in the *EH&S Lab Safety Orientation*. Regular users of DM should have a hard copy MSDS available - see the EH&S website for electronic access. The MSDS will cover the issues above and many others (e.g., flammability, spill clean-up, etc.).

Chemical Hygiene Plan – Per Cal-OSHA, dichloromethane is considered a **Particularly Hazardous Substance**. Therefore, its safe use must be addressed in your laboratory’s written Chemical Hygiene Plan (CHP). Since many safety issues are addressed generically in this document, it can be used as a resource in developing your CHP. Lab supervisors/PIs should contact EH&S at x-4899 if you need an orientation to this requirement.