

Methylene Chloride / Dichloromethane

Standard Operating Procedure Template

Type of SOP: Process Hazardous Chemical Hazard Class

To customize this SOP, add lab-specific information to the sections below marked in RED, as applicable. Completion of the last section ("Lab-Specific Information") is required. Also, any of the content below may be amended with lab-specific information to enhance worker safety as desired.

For more information, consult a Safety Data Sheet for this material.

Usage

Methylene chloride, also known as dichloromethane (DCM) is commonly used as a reaction solvent, a solvent for extractions in isolating organic compounds, and as an eluent for flash and thin-layer chromatography.

Hazard Overview

Acute Effects: Hazardous in case of eye contact (irritant), of ingestion, of inhalation. In case of ingestion, DCM may cause irritation of the gastrointestinal tract with vomiting. If vomiting results in aspiration, chemical pneumonia could follow. Absorption through gastrointestinal tract may produce symptoms of central nervous system depression ranging from light headedness to unconsciousness. Hazardous in case of skin contact (irritant, permeator). Inflammation of the eye is characterized by redness, watering, and itching. Eye contact may cause temporal eye damage.

Chronic Effects: Can cause headache, mental confusion, depression, liver effects, kidney effects, bronchitis, loss of appetite, nausea, lack of balance, and visual disturbances. Can cause dermatitis upon prolonged skin contact.

Mutagenic Effects: Methylene chloride may cause cancer in humans.

Developmental Toxicity: The substance is toxic to lungs, the nervous system, liver, mucous membrane

Due to its carcinogenicity and toxicity, DCM is specifically [regulated](#) by Cal-OSHA. It has designated *Permissible Exposure Limits* via inhalation which cannot legally be exceeded in the workplace:

- *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

Therefore, given its volatility, it should always be used in a fume hood, glove box, or sealed containers.

Personal Protective Equipment (PPE)

See the PPE information under Sec. II of the *UCSB Chemical Hygiene Plan* regarding:

- the UC PPE Policy and policy summary (what PPE is needed and when/where to use)
- obtaining your free PPE via use of the *Laboratory Hazard Assessment Tool*
- glove selection criteria
- respirator use, etc.

Gloves – the most common gloves found in campus labs/storerooms (nitrile, neoprene and latex) are not recommended for use with DCM 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.

Engineering Controls

All operations involving DCM should be carried out in a certified chemical fume hood to keep airborne level below recommended exposure limits.

For further information on engineering controls see the following pages in Sec. II of the *UCSB Chemical Hygiene Plan*:

- UCSB Fume Hood Usage Guides
- Criteria for Implementing Engineering Controls

Spill and Incident Procedures

See directions under the “Chemical Incident” and “Medical Emergency” tabs of the *UCSB Emergency Information Flipchart* – should already be posted in all labs. For chemical-specific first-aid information, see the Safety Data Sheet.



Special Handling and Storage Requirements

- ✓ Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition.
- ✓ Segregate the chemicals from incompatible materials

Decontamination/Waste Disposal Procedure

No waste streams containing methylene chloride shall be disposed of in sinks. Wash hands and arms with soap and water after finished. Contaminated pipet tips, eppendorf tubes, and gloves should be discarded as hazardous waste according to UCSB EH&S waste disposal procedures - see “Chemical Waste Disposal” in Sec. II of the *UCSB Chemical Hygiene Plan*.

Safety Data Sheet (MSDS) Location

Found online at: <http://ehs.ucsb.edu/labsafety/msds>

Designated Area

Methylene Chloride may only be used in the metal fume hoods on the north wall (not in the polypropylene hood on the south wall) It is stored in the left-most cabinet of fume hood #1 (closest to the door).

Prior Approval/Review Required

Prior approval is required before using Methylene Chloride.

LAB-SPECIFIC INFORMATION (required) ([Examples of appropriate content](#))

Methylene – chloride is only approved for use to bond acrylic. A kit with the chemical, a syringe with a blunt needle and useful clamps is stored in the left-most cabinet under fume hood #1.