## Standard Operating Procedure

# **Dichloromethane Exposure Control Plan**

(Methylene Chloride)

## Overview

Dichloromethane is an anesthetic. Inhaling the vapor can cause light-headedness leading to unconsciousness and even death. Other symptoms of exposure include skin, eye and respiratory tract irritation. Strong evidence supports that dichloromethane is a human carcinogen upon chronic exposure. Its high volatility makes it imperative that it be handled in a fume hood or other vapor-capturing device. Unlike many organic solvents, dichloromethane is not flammable. Dichloromethane is considered a Particularly Hazardous Substance (PHS). It is also tightly regulated by EPA under 40 CFR part 751 Subpart B, as described in the UC Santa Barbara Chemical Hygiene Plan, and therefore requires an Exposure Control Plan (ECP). Completion of this SOP template fulfills this requirement.

## Substitution

Per EPA regulations, substitution of dichloromethane for other less hazardous solvents must be considered before use:

The following substitutes have been considered for dichloromethane:

* 2-Methyltetrahydrofuran
* Cyclopentylmethyl ether
* Methyl tert-butyl ether
* Methyl isobutyl ketone
* Toluene
* Ethyl acetate
* Methanol
* Ethanol
* Isopropanol
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

They have been deemed inadequate for the following reason(s):

* Undesirable cross-reactivity
* Poor match for polarity
* Poor match for density
* Boiling point too high
* Need to maintain reproducibility of established procedure
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Special Handling and Storage Concerns

**Personal Protective Equipment**

Dichloromethane may only be handled while wearing the following PPE:

* Eye Protection
  + Safely glasses
  + Goggles
  + Face shield
  + Other \_\_\_\_\_\_\_\_\_\_\_\_
* Skin Protection
  + Lab coat
  + Apron
  + Other \_\_\_\_\_\_\_\_\_\_\_\_
* Hand Protection
  + Nitrile gloves (Double gloved)
  + Polyvinyl alcohol gloves
  + LLDPE gloves
  + Viton gloves
  + Silvershield gloves

**Special Storage Requirements**

Dichloromethane is a PHS. Each container must include all applicable hazard warnings. It is recommended that the appropriate GHS pictograms also be on the container. The storage area must be within a PHS designated area, and all containers stored in secondary containment.

**Engineering Controls**

Dichloromethane will be used with the following engineering controls in place:

* Local Exhaust Ventilation (select one)
* Fume hood
* Glove box
* Exhausted enclosure
* Snorkel
* Splash shield
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Mandatory Exposure monitoring has been conducted by EH&S. Date \_\_\_\_\_\_\_\_\_\_

**Special Handling Considerations**

Only use dichloromethane in a PHS in a designated area. This designated area may be the entire laboratory, or only a portion of it.

**Decontamination**

Standard decontamination procedures apply. Use great caution in avoiding exposure.

## Waste Management

Standard waste disposal procedures apply.

## First Aid and Emergencies

**Spill**

Treat all spills of benzene as major spills. Do not attempt to clean up the spill yourself. Notify others in the area of the spill, including your supervisor. Evacuate the area and call 911. Remain on-site at a safe distance to provide detailed response to first responders. Report any exposures to EH&S.

**Fire**

Dichloromethane is not itself flammable. Standard firefighting measures apply

**Personnel Exposure**

*Skin or eye contact*: Remove contaminated attire. Flush affected area with water for 15 minutes. If symptoms persist, get medical attention.

*Inhalation:* Move person to fresh air. Consult a physician is symptoms persist.

*Ingestion:* DO NOT induce vomiting. Rinse mouth with water. Consult a physician.

## Laboratory Specific Information

**Pre-Approval by the Principal Investigator is required before use of dichloromethane. Do not use dichloromethane until you have obtained the necessary preapproval.**

All occupants of INSERTLABROOM shall review this SOP/ECP as well as the UC Santa Barbara Chemnical Hygiene Plan prior to entry and sign that they have received the information they contain and agree to abide by the training provided to them.

Dichloromethane is approved for use in INSERTLABROOM in INSERTUSELOCATION(S).

Dichloromethane is approved for storage in INSERTLABROOM in INSERTSTORAGELOCATION(S).

Stop all use of dichloromethane if any malfunction of the local exhaust ventilation device indicated above is suspected and contact EHS.

If skin irritation, eye irritation, or drowsiness or dizziness occurs while using dichloromethane, immediately stop the procedure. Similarly, if a sweet odor is emitted, stop the procedure and remove yourself from the area. This indicates exposure to dichloromethane. Contact EH&S for exposure monitoring and seek medical attention if necessary.

Any PPE suspected of coming in contact with dichloromethane must be changed immediately.

**Experimental Conditions of Use**

**Temperature Range:**

**Pressure Range:**

**Scale Range:**

**Other Relevant Details:**