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**Standard Operating Procedure
For work with**

Chemical name/class:	Methylene chloride/Dichloromethane	CAS #:	75-09-2
Formula:	CH₂Cl₂	Weight %	>99.5

Instructor/ PI:	Building/ Room:	Storage	Waste Container
Dr. Sam-Shajing Sun	MCAR 302-304	WSB 302	MCAR 302
Dr. Wondwossen Arasho	WSB 135	WSB 131	WSB 135

1. Circumstances of Use

Methylene chloride/Dichloromethane is used as a solvent or reagent in chemical reactions.

2. Potential Hazards

- GHS Classification in accordance with 29 CFR 1910 (OSHA HCS): Skin irritation (Category 2), H315; Eye irritation (Category 2A), H319; Carcinogenicity (Category 2), H351; Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336.
- Methylene chloride/dichloromethane exposure can cause central nervous system, liver, and cardiovascular effects. It is metabolized by the body to carbon monoxide and can affect the blood's ability to transport oxygen. It is a suspected carcinogen. It is a very volatile liquid that penetrates readily through standard nitrile laboratory gloves.
- The OSHA Permissible Exposure Limit for Methylene chloride/dichloromethane is 25 ppm (87 mg/m³) for 8 hours or 125 ppm (435 mg/m³) for 15 minutes. There is a substance-specific OSHA standard and an action limit of 12.5 ppm.
- Consult the [Safety Data Sheet \(SDS\)](#), [OSHA](#), and the [National Institute for Occupational safety and Health](#) for additional information on hazards.

3. Engineering Controls

- Work with open containers of methylene chloride/dichloromethane should be conducted only in a fume hood.
- Dilute solutions, small quantities, and closed containers of methylene chloride may be handled on the bench top.
- If it is reasonably foreseeable that an employee's eyes may contact solutions containing 0.1 percent or greater (for example through splashes, spills or improper work practices), the OSHA methylene chloride standard requires eyewash facilities within the immediate area for emergency use. OSHA also requires that affected employees use these facilities as needed.
- If it is reasonably foreseeable that employees' skin may contact solutions containing 0.1 percent or greater (for example, through splashes, spills or improper work practices), the OSHA methylene chloride standard requires

conveniently located washing facilities capable of removing the MC. OSHA also requires that affected employees use these facilities as needed.

4. **Work Practice Controls**

- Work should be planned so that glove contact will not occur. See PPE section for glove recommendation for spills.
- Keep containers closed as much as possible. Handle open containers only in a chemical fume hood.
- Use in the smallest practical quantities for the experiment being performed.
- Typical laboratory use of methylene chloride/dichloromethane should not put employees at risk of overexposure, but labs using large amounts should contact [NSU Environmental Health, Safety, and Risk Management](#) (EHS &RM) at 757-823-9142 for exposure assessment.
- Designate an area for working with methylene chloride/dichloromethane, and label it as such.
- Once work is complete, wipe down work area with soap and water solution.

5. **Personal protective equipment (PPE)**

WARNING: Methylene chloride/dichloromethane readily penetrates standard disposable nitrile laboratory gloves (and many other types of gloves).

- Wear latex or thick/non disposable gloves or two pairs of disposable nitrile gloves so that gloves do not contact the chemical.
- Remove outer gloves immediately (if two gloves) if splashed. Remove inner gloves also if degradation is noted.

Also wear safety glasses and a lab coat. If a splash may occur, wear a face shield with chemical splash goggles, and an impervious apron over the lab coat.

Gloves for spills: Labs using methylene chloride/dichloromethane should have latex or [North Silver Shield/4H laminate gloves](#) (which will provide protection for approximately 8 hours) or [Fluorocarbon Rubber Gloves](#). Do NOT use double nitrile gloves for spills due to quick breakthrough time. To improve dexterity with laminate gloves, put a nitrile glove over the laminate glove. Be sure to check the glove guide for the specific glove you purchase if not listed here. Not all laminate gloves provide good protection for methylene chloride/dichloromethane. Fluorocarbon Rubber gloves offer more protection against aggressive chemicals.

6. **Transportation and Storage**

- Transport methylene chloride/dichloromethane in secondary containment, preferably a polyethylene or other non-reactive acid/solvent bottle carrier.
- Keep container in cool, well-ventilated area.
- Keep container tightly closed and sealed until ready for use.
- Store in secondary containment away from moisture, strong oxidizers, strong caustics, plastics, rubber, nitric acid, water + heat, and chemically active metals, such as aluminum and magnesium powder, sodium, potassium, and lithium.
- Avoid storing on the floor.
- Avoid ignition sources.

7. **Waste Disposal**

- Waste methylene chloride/dichloromethane must be disposed of following your laboratory-specific chemical hygiene plan and the requirements of Methylene chloride waste is handled as a hazardous waste.
- Methylene chloride should be collected with other halogenated solvents and should not be commingled with

other types of hazardous waste.

- Halogenated waste containers should be labeled, in good condition, and stored in the laboratory or designated waste management area.
- Environmental Hazard: Do not pour methylene chloride/dichloromethane down the drain or allow to go to a drain.

8. **Exposures/Unintended Contact**

Contact [NSU Environmental Health, Safety, and Risk Management](#) (EHS &RM) at 757-823-9142 for medical advice on occupational chemical exposures. For actual exposure and medical call NSU campus police at 757-823-9000 so they can contact and direct emergency vehicles to your location. Advice for an actual chemical exposure/injury are:

- **General advice:** Show material safety data sheet to the doctor in attendance.
- **If inhaled:** Move patient to obtain fresh air. Call in physician.
- **In case of skin contact:** Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.
- **In case of eye contact:** Rinse eye(s) with plenty of water. Call in ophthalmologist. Remove contact lenses.
- **If swallowed:** Immediately make victim drink water (two glasses at most). Consult a physician.
- **If caught on fire:** Use water, foam, carbon dioxide (CO₂), or dry powder extinguisher. Contact NSU campus police at 757-823-9000 so they can contact and direct emergency vehicles to your location.

9. **Spill Procedure**

Most spills of methylene chloride/dichloromethane outside of a chemical fume hood should be referred to the EHS &RM at 757-823-9142.

Employees in the area should be prepared to clean up minor spills, including most spills confined to the chemical fume hood. Wearing Silvershield, [Fluorocarbon Rubber Gloves](#), or other gloves for spills protection (not nitrile), splash goggles, face shield and lab coat (and impermeable apron, if available), use absorbent pads to absorb spilled material. Wipe down contaminated area with soap and water solution.

Contaminated PPE and clean-up materials must be placed in a compatible container - Note that methylene chloride/dichloromethane will attack some forms of plastic, so a plastic bag may not be appropriate. Call [NSU Environmental Health, Safety, and Risk Management](#) (EHS &RM) at 757-823-9142 immediately for pick-up.

NOTE: If there is respiratory irritation associated with exposure, remove all persons from the contaminated area and contact the EHS & RM spill team.

10. **Training of personnel**

- All personnel are required to complete the online General Lab Safety. This session includes an introduction to general chemical safety.
- Training on lab-specific methylene chloride/dichloromethane procedures is required for all personnel working with these materials, and must be documented (topics covered, date, employee names and signatures).
- All personnel shall read and fully adhere to the laboratory-specific SOP for methylene chloride and shall document that they have read it by signing and dating the SOP.

"I have read and understand this SOP. I agree to fully adhere to its requirements."

Last	First	NSU ID	Signature	Date