**Standard Operating Procedures**

Laboratory Specific

**Chemical:** ***Methylene Chloride / Dichloromethane***

Please fill out the form completely.  Print a copy and insert into your

 *Laboratory Safety Manual and Chemical Hygiene Plan*.

Refer to instructions for assistance.

Department: Date when SOP was written:

Date when SOP was approved by the lab supervisor:

Principal Investigator:

Internal Laboratory Safety Coordinator/Lab Manager:

Laboratory Phone:     Office Phone:

Emergency Contact:

Location(s) covered by this SOP:

**Type of SOP:** **[ ]** Process **[x]** Hazardous Chemical **[ ]** Hazard Class

**Purpose**

Methylene chloride or dichloromethane (DCM) is commonly used as a solvent for thin-layer chromatography in isolating organic compounds. Dichloromethane is one of California’s Regulated Carcinogens. This SOP documents the safe use of DCM including the minimization of inhalation of dichloromethane. Use of methylene chloride in the laboratory would result in “short term exposure,” which the State limits to 125 ppm for 15 minutes.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: 75-09-2

Class: **OSHA regulated carcinogen**

 Carcinogen (IARC Group 2B)

Molecular Formula: CH2Cl2

Form (Physical State): Liquid

**Potential Hazards/Toxicity**

LD50

Oral: 1600 mg/kg [Rat]

Permission Exposure Limits (PEL): 25 ppm

 12.5 ppm (8-hour TWA – Action Level)

Acute Effects

Very 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

**Personal Protective Equipment (PPE)**

The level of skin and eye protection should be selected based on the potential for splashing and other forms of exposure.

*Minimum potential for splash & exposure:*

* Single pair of chemical resistant gloves
* Protective clothing (e.g. non-porous lab coat, impervious sleeves; closed-toed impervious shoes)

*When using or transferring large quantities (>1 L):*

* Single pair of chemical resistant gloves
	+ Immediately replace with new gloves when splash occurs.
* Chemical resistant lab coat
	+ - Avoid using the traditional cotton-polyester white lab coat, which readily collects/absorbs compounds.
* Protective clothing (e.g. non-porous sleeves, closed-toed impervious footwear)

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by ORS and should contact occhealt@uga.edu. This is a UGA requirement described in more detail in the [UGA Respiratory Protection Plan](https://esd.uga.edu/sites/default/files/respiratoryprotection.pdf) and supported by the [Office of Research Occupational Health and Safety Program](https://research.uga.edu/ohsp/).

**Engineering Controls**

* All operations involving methylene chloride and dilutions should be carried out in a certified chemical fume hood or a ducted Biosafety cabinet to keep airborne level below recommended exposure limits
* Chemical fume hoods used as containment areas for particularly hazardous chemicals must have a face velocity of 100 cfm, averaged over the face of the hood and must be certified annually.
* Laboratory rooms must be at negative pressure with respect to the corridors and external environment. The laboratory/room door must be kept closed at all times.
* Vacuum lines are to be protected by HEPA (high efficiency particulate air) filters or higher efficiency scrubbers.

**First Aid Procedures**

Skin & Eye Exposure: Minor skin contact requires washing with soap and water. Soaking or flushing contaminated areas of the skin with water for periods up to 15 minutes is required if a large area comes into contact with the chemical, or if prolonged contact occurs. Contaminated clothing may hold the chemicals in contact with the skin without being immediately noticed.

In the event of eye contact, the eye should be immediately be flushed with water. If the chemical is very irritating, it is likely that the affected individual will require assistance to hold the eye open during the flushing.

Ingestion: DO NOT induce vomiting, give milk or water if conscious, and get medical attention immediately.

Inhalation: Remove rapidly to clean air. Administer rescue breathing if necessary and call emergency services. Seek medical attention if needed.

**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.
* Store in secondary containment, isolate from other chemical compounds with proper labeling: **REGULATED CARCINOGEN**
* DCM can be stored in the same cabinet as other regulated carcinogen
* Segregate the chemicals from incompatible materials.

**Designated Areas**

* Designated area(s) for use and storage of methylene chloride must be established.
* All chemicals containing methylene chloride must be secondarily contained with proper signage
* Signage is required for the container, designated work area and storage location. Sign wording must state the following:

“DANGER, CANCER HAZARD”

**Spill and Accident Procedure**

**Chemical Spill Dial 911**

**24-7 On-Call Response to Research, Environment, Health or Safety Concerns Dial 2-5561 from a campus phone or 706-542-5561 from a non-campus line.**

**Spill** – Follow the procedures set out in the [UGA Chemical and Laboratory Safety Manual.](http://research.uga.edu/docs/units/safety/manuals/Chemical-Laboratory-Safety-Manual.pdf)

[If there are any chemical-specific protocols for responding to a spill, insert them here or mark “none”:]

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# **Medical Emergency Dial 911**

**Life Threatening Emergency, After Hours, Weekends And Holidays** – Dial **911** or the emergency phone numbers listed at the beginning of the UGA Chemical and Laboratory Safety Manual

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Non-Life Threatening Emergency** – Follow the instructions in the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Decontamination/Waste Disposal Procedure**

**For general hazardous waste disposal procedures, see Appendix H of the UGA Chemical and Laboratory Safety Manual.**

**Chemical Specific Procedures: [to be inserted or marked as “none”]**

**Safety Data Sheet (SDS) Location**

UGA personnel can access Online SDS through a link in the upper left corner of the ESD home page (<https://esd.uga.edu>) and logging in by using their UGA email user name and password.

**Protocol/Procedure**

***(Add specific description of procedure)***

**Any deviation from this SOP requires approval from PI.**

**Documentation of Training** *(signature of all users is required)*

* Prior to conducting any work with methylene chloride, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and access to the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last 12 months.

I have read and understand the content of this SOP:

**Name Signature Date**

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