

DESERT RESEARCH INSTITUTE
Guidelines for Laboratory-Scale Use of
METHYLENE CHLORIDE (MeCl₂)/DICHLOROMETHANE (DCM)
(Methylene Dichloride)

INTRODUCTION

Methylene chloride is a suspect human carcinogen and as such is considered a particularly hazardous substance (PHS). The use of methylene chloride requires completion of a PHS Use Approval Form and the purchase of this chemical must be approved by the Principal Investigator before ordering. The amount purchased should be limited to only the quantity needed to complete the project to avoid disposing the excess as hazardous waste. The user is responsible for ensuring a current Material Safety Data Sheet (MSDS) is obtained unless a one is already available within the laboratory.

The use of methylene chloride must be conducted in designated areas (preferably a chemical hood) within the laboratory unless the laboratory itself has been deemed a designated use area. Use areas are required to be posted with appropriate warnings (see Section V.B of the DRI Chemical Hygiene Plan). Additional lab specific details on how and where methylene chloride is used in the lab and lab specific safety measures shall be outlined on the PHS Use Approval Form and may be appended to this document or included in other lab specific safety documents that are used for employee lab specific safety education.

POTENTIAL HAZARDS

In addition to the potential cancer hazard, adverse reproductive effects in animals have been shown. Exposure to methylene chloride can cause kidney damage. The odor threshold is between 205-307 ppm and is a poor indicator of exposure.

Acute Exposure: Ingestion can cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness and nausea. Inhalation may cause unconsciousness and coma. Causes respiratory tract irritation. May cause blood changes. Causes formation of carbon monoxide in blood which affects the cardiovascular and nervous systems. Can produce delayed pulmonary edema. Contact with eyes may cause severe irritation and possible eye burns. May be absorbed through skin causing irritation with burning pain, itching, and redness. Prolonged exposure may result in skin burns.

Chronic Exposure: Possible cancer hazard based on tests with lab animals. Prolonged or repeated skin exposure may cause dermatitis. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause conjunctivitis and/or corneal burns.

As a suspect human carcinogen, methylene chloride is regulated by OSHA in Title 29 Code of Federal Regulation 1910.1052 Lab-scale use of methylene chloride is exempted from the standard provided exposures to laboratorians is less than the action level of 12.5 ppm (which is one half the permissible exposure limit) as averaged over an eight hour working day. Methylene chloride has poor warning properties (the odor threshold is 205 - 307 ppm), therefore, odor only serves as a warning of exposure (i.e., not smelling it does not mean you are not exposed). **If airborne exposure is suspected** at or above the action level, stop work and **contact EH&S** for assistance in conducting a work hazard assessment and hazard mitigation and monitoring protocol.

PERSONAL PROTECTIVE EQUIPMENT

Viton[®] or neoprene materials should be used for potential skin contact. Natural rubber and polyvinyl materials **should not** be used. ANSI Z87 safety glasses or chemical safety goggles shall be used and

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supplemented by the addition of a full face shield where splashing is possible. Use of an apron over lab coat is recommended if splash hazards exist.

ENGINEERING CONTROLS

Use adequate general or local exhaust ventilation to keep exposures below the PEL. Use of local exhaust or a chemical hood is preferable because they control the emissions at the source, preventing dispersion into the general work area. Use only in areas equipped with an emergency eyewash and safety shower.

SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Keep away from ignition sources. Use only with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep in a tightly closed container, store in a cool, dry, ventilated area. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquids). Make sure appropriate container material is used since methylene chloride may corrode plastic and rubber.

SPILL & ACCIDENT PROCEDURES

Skin contact: Immediately flush with copious amounts of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops and persists.

Eye contact: Immediately flush with copious amounts of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Inhalation: Remove from exposure area and to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel or the Poison Control Center (1-800-222-1222). Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Incidental Spill: Do not attempt cleanup if you feel unsure of your ability to do so, or if you perceive the risk to be greater than normal laboratory operations. Ventilate the area and use proper personal protective equipment. Remove sources of ignition. Contain and recover liquid when possible. Absorb spill with inert material (e.g., vermiculite, sand). Place material in a suitable disposal container labeled with the words "hazardous waste". Do not flush to sanitary sewer and avoid runoff into storm sewer and ditches which lead to waterways.

Large Spill: Alert others in the immediate area, provide adequate ventilation, remove all ignition sources, evacuate the laboratory, close the doors, and call EH&S emergency number 775-742-6330.

DECONTAMINATION

After cleaning up spilled materials, thoroughly wash the area with soap and water, then rinse. Treat all clean up materials as non-RCRA wastes. Specific instructions may be developed for the lab and should be included here_____

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WASTE DISPOSAL

Methylene chloride waste and spill clean up materials should be placed in properly labeled, suitable containers with securely sealed lids. Submit a [Request for Waste Disposal Form](#) to EH&S to arrange for pick up and disposal.

MSDS LOCATION (list lab specific location here) _____

TRAINING

Lab specific standard operating procedures must be developed and all laboratorians who work with or are potentially exposed to methylene chloride in the lab must receive documented training and education about the hazards and how to minimize them.