DS Fact Sheet:
Working Safely with Dichloromethane (DCM, Methylene Chloride)

National Institutes of Health (NIH) • Office of Research Services (ORS) • Division of Safety (DS)

What is Dichloromethane (DCM, Methylene Chloride)

Dichloromethane, also known as methylene chloride or DCM is a highly volatile organic solvent with a sweet odor, and is a Particularly Hazardous Substance (carcinogen, reproductive toxin, or acute toxin) under OSHA Laboratory Standard.

Health Hazards

Hazards	Definition
	**Carcinogen**: Methylene chloride (dichloromethane, DCM) is a Class 1B carcinogen. Causes skin irritation, serious eye irritation, may cause drowsiness, dizziness, or damage to organs through prolonged or repeated exposure. **Acute Toxicity**: Neurotoxicity effects (central nervous system) are the most serious adverse effects of acute inhalation and dermal exposures of DCM. High-level exposure of methylene chloride can cause dizziness that can result in sudden loss of consciousness or death.

Applicable Regulations

- 2024 Methylene Chloride Regulation under the Toxic Substances Control Act (TSCA)
- OSHA Methylene chloride standard 1910.1052
- OSHA Hazard Communication 1910.1200
- OSHA Occupational exposure to hazardous chemicals in laboratories 1910.1450

DCM regulation under the Toxic Substance Control Act (TSCA)

The Environmental Protection Agency (EPA) determined that DCM presents an unreasonable risk of injury to human health and issued a final ruling in April 2024 regulating the use under the Toxic Substances Control Act (TSCA) to protect users from health risks such as neurotoxicity effects and cancer.

Under the new EPA regulation, most of the uses of DCM are banned and the exempted uses like research must establish a workplace chemical protection program (WCPP) to continue its use. The EPA also established a new exposure limit to ensure the safety of the users. The new inhalation exposure limit for DCM (Existing Chemical Exposure Limits (ECEL)) is 2 ppm as an 8-hr Time Weighted Average (TWA) and 16 ppm as a 15-min TWA. The WCPP also requires establishing an exposure monitoring program with initial monitoring and continued periodic monitoring.

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Standard Operating Procedure (SOP)

DCM is classified under OSHA as a Particularly Hazardous Substance (PHS) due to the health hazards associated with this chemical. Refer to the NIH Chemical Hygiene Plan (CHP) for guidance on working safely with PHSs. Principal investigators (PIs) are responsible for developing a SOP using the NIH SOP template and complying with all the requirements under NIH CHP.

Personal Protective Equipment (PPE)

The minimum PPE requirement for handling hazardous chemicals or items that are contaminated with chemicals are a clean buttoned lab coat, safety goggles, and nitrile gloves along with proper lab attire (covered legs and closed toe shoes).

Additional PPE may be required depending on the nature of the work. Halogenated solvents are known to penetrate nitrile gloves and DCM readily penetrates nitrile gloves in less than 10 minutes. When working with small quantities of DCM at a minimum, double glove with nitrile or nitrile and neoprene combination gloves such as Ansell 93-260. Immediately remove the gloves if they become contaminated.

For spill cleanup and work with larger volumes, it is recommended to wear Ansell 2-100 liners or SilverShield gloves under a nitrile or nitrile and neoprene combination glove.

Working with DCM

PIs are required to train all users of DCM on the hazards, use, emergency response, and decontamination. Review the SDS, SOP, and this fact sheet before starting to work with DCM. All work with DCM must be done in a certified chemical fume hood. Areas where DCM is handled or stored should be marked with "Designated Area" signage. Any other personnel authorized or required to be in the laboratory during work must be provided with general chemical safety awareness training.

Storage

Store DCM in a secondary containment, away from incompatible chemicals to help prevent breaks and spills. Attach a warning label to the secondary containment to alert others of the chemical and the need for special precautions.

Monitoring

Personal monitoring will be conducted by the DS to evaluate employee exposure, including the efficacy of exposure controls and work practices. Additional monitoring is required if personal exposure exceeds the limits described in the EPA Standard. Periodic monitoring will be conducted by DS to ensure personal exposures remain below the EPA established limits.

Emergency Response

For medical help and spills refer to numbers on the right. All spills involving PHS are High-level hazard spills.	Contact the Fire Department: **Bethesda, MD** – 911 on-campus, 9-911 off-campus, or 301-496-9911 (cell phone) **Baltimore, MD** – 911 **Frederick, MD** – 911 **Hamilton, MT** – 911 **Research Triangle Park, NC** – 911 (landline), 919-541-2800 (cell phone)
For dermal & eye exposure, wash immediately under eye-wash or safety shower for at least 15 minutes.	Seek medical attention if needed as described above. The injury should be immediately reported to your local OMS clinic: **Bethesda, MD**: Building 10, Room 6C306; (301) 496-4411. **Baltimore, MD**: BRC 01B210; (667) 312-5843 **Frederick, MD**: 8200 Research Plaza, Room 1B116; (301) 631-7233 **Hamilton, MT**: 903 South 4th Street, Room 5202; (406) 375-9755 **Research Triangle Park, NC**: 111 T W Alexander Drive, Building 101, Room E111; (984) 287-4178.

Waste Disposal

Follow the NIH Waste Disposal Guide for disposal of DCM and materials contaminated with DCM.