

SAFETY DATA SHEET

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Section 1, Identification

- Catalog Number: S-4L-DCM, S-4X4L-DCM
- Product Name: Dichloromethane
- Alternate Name: Methylene chloride; Methane dichloride; Methylene bichloride; Methylene dichloride; Dichloromethane; DCM.
- Chemical family: Solvent
- Recommended Use: Peptide Synthesis
- Restrictions on Use:

Section 2, Hazard(s) Identification



- **Appearance:** colorless liquid.
- **Warning!** Methylene chloride is metabolically converted to carbon monoxide after systemic absorption, which yields increased concentrations of carboxyhemoglobin in the blood. Harmful if swallowed. Causes eye, skin, and respiratory tract irritation. May be harmful if inhaled. Potential cancer hazard. This substance has caused adverse reproductive and fetal effects in animals. May cause central nervous system effects. May cause kidney damage.
- **Target Organs:** Blood, central nervous system.
- **Potential Health Effects**
 - **Eye:** Contact with eyes may cause severe irritation, and possible eye burns.
 - **Skin:** May be absorbed through the skin. Causes irritation with burning pain, itching, and redness. Prolonged exposure may result in skin burns.
 - **Ingestion:** Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause carboxyhemoglobinemia.
 - **Inhalation:** Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause narcotic effects in high concentration. Vapors may cause dizziness or suffocation. May cause blood changes. Overexposure may cause an increase in carboxyhemoglobin levels in the blood. Can produce delayed pulmonary edema. Because of its high volatility, airborne concentrations of methylene chloride can accumulate in poorly ventilated areas. Odor is a poor indicator of possibly dangerous air concentrations of methylene chloride.

- **Chronic:** Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause dermatitis. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause lung, liver, and pancreatic tumors. May cause conjunctivitis and/or corneal burns.

Section 3, Composition/information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
75-09-2	Methylene Chloride	>99.5	200-838-9

Section 4, First-Aid Measures

- **Eyes:** In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.
- **Skin:** In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.
- **Ingestion:** If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.
- **Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
- **Notes to Physician:** Treat symptomatically and supportively.

Section 5, Fire-Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. No flash point in conventional closed tester, but forms flammable vapor-air mixtures in larger volumes and may be an explosion hazard in a confined space.

- **Extinguishing Media:** Use water spray, dry chemical, carbon dioxide, or appropriate foam.
- **Flash Point:** Not applicable.
- **Autoignition Temperature:** 556 °C (1,032.80 °F)
- **Explosion Limits, Lower:**13 vol %
- **Upper:** 23 vol %
- **NFPA Rating:** (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6, Accidental release measures

- **General Information:** Use proper personal protective equipment as indicated in Section 8.
- **Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation.

Section 7, Handling and storage

- **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 heat, sparks and flame. Use only with adequate ventilation. Avoid breathing vapor or mist.

- **Storage:** Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Store below 40°C. Keep away from active metals.

Section 8, Exposure Controls/Personal Protection

- **Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
- **Exposure Limits**

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methylene chloride	50 ppm TWA	2300 ppm IDLH	12.5 ppm Action Level; 25 ppm TWA; 125 ppm STEL (15 min. Cancer, cardiac effects, central nervous system effects, liver effects, and skin and eye irritation - See 29 CFR 1910.1052)

- **OSHA Vacated PELs:** Methylene chloride: 500 ppm TWA
- **Personal Protective Equipment**
- **Eyes:** Wear chemical splash goggles.
- **Skin:** Viton gloves are recommended.
- **Clothing:** Wear appropriate protective clothing to prevent skin exposure.
- **Respirators:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9, Physical and Chemical Properties

- **Physical State:** Liquid
- **Appearance:** colorless
- **Odor:** ethereal odor - chloroform-like
- **pH:** Not available
- **Vapor Pressure:** 350 mm Hg @ 20 °C
- **Vapor Density:** 2.93 (Air=1)
- **Evaporation Rate:** Not available
- **Viscosity:** Not available
- **Boiling Point:** 40 °C
- **Freezing/Melting Point:** -97 °C
- **Decomposition Temperature:** Not available.
- **Solubility:** Slightly soluble
- **Specific Gravity/Density:** 1.33 (Water=1)
- **Molecular Formula:** CH₂Cl₂
- **Molecular Weight:** 84.93

Section 10, Stability and Reactivity

- **Chemical Stability:** Stable at room temperature in closed containers under normal storage and handling conditions. May form explosive mixtures in atmospheres having high oxygen content.
- **Conditions to Avoid:** Excess heat, attacks some plastics, rubber, and coatings, confined spaces, when no water is present, dichloromethane is not corrosive to metals. At high temperatures and in the presence of water (causing slow decomposition forming HCl), corrosion of iron, some stainless steels, copper and aluminum can occur.
- **Incompatibilities with Other Materials:** Strong oxidizing agents, strong bases, chemically active metals.
- **Hazardous Decomposition Products:** Hydrogen chloride, phosgene, carbon monoxide, carbon dioxide.
- **Hazardous Polymerization:** Will not occur.

Section 11, Toxicological information

- **RTECS#:**
- **CAS#** 75-09-2: PA8050000
- **LD50/LC50:**
- **CAS#** 75-09-2:
 - Draize test, rabbit, eye: 162 mg Moderate;
 - Draize test, rabbit, eye: 10 mg Mild;
 - Draize test, rabbit, eye: 500 mg/24H Mild;
 - Draize test, rabbit, skin: 810 mg/24H Severe;
 - Draize test, rabbit, skin: 100 mg/24H Moderate;
 - Inhalation, mouse: LC50 = 14400 ppm/7H;
 - Inhalation, mouse: LC50 = 49100 mg/m³/6H;
 - Inhalation, mouse: LC50 = 54000 mg/m³/2H;
 - Inhalation, mouse: LC50 = 56220 mg/m³/7H;
 - Inhalation, rat: LC50 = 52 gm/m³;
 - Inhalation, rat: LC50 = 76000 mg/m³/4H;
 - Inhalation, rat: LC50 =
- **Carcinogenicity:**
 - **CAS#** 75-09-2:
 - **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
 - **California:** carcinogen, initial date 4/1/88
 - **NTP:** Suspect carcinogen
 - **IARC:** Group 2B carcinogen
- **Epidemiology:** There are few reports of injury despite widespread use of dichloromethane (ACGIH, 1991). Solvent abuse has led to death (Harbison, 1998).
- **Teratogenicity:** Inhalation, rat: TCLo = 4500 ppm/24H (female 1-17 day(s) after conception) Effects on Newborn - behavioral.; Inhalation, rat: TCLo = 1250 ppm/7H (female 6-15 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system and urogenital system.
- **Reproductive Effects:** Adverse reproductive effects have occurred in experimental animals.
- **Mutagenicity:** DNA inhibition: Human, Fibroblast = 5000 ppm/1H (Continuous).; Morphological transformation: Rat, Embryo = 160 umol/L.; DNA damage: Oral, rat = 1275 mg/kg.; Inhalation, mouse: TCLo = 2000 ppm/5H/2Y-C (Tumorigenic - Carcinogenic by RTECS criteria--Lungs, Thorax, or Respiration - Tumors).
- **Neurotoxicity:** The neurotoxicity is thought to be due to a direct nonspecific CNS depressant action of dichloromethane and to indirect effects of carbon monoxide. Dichloromethane may exert acute effects on the nervous system by mechanisms related to its lipophilicity.

Section 12, Ecological information

- **Ecotoxicity:** Fish: Bluegill/Sunfish: 230mg/L; 24H; StaticFish: Fathead Minnow: 196mg/L; 96H; This chemical has a moderate potential to affect some aquatic organisms. It is resistant to biodegradation, and has a low potential to persist in the aquatic environment. 96-hr. EC50 (loss of equilibrium); Fathead minnow: 99mg/L; 96-hr. EC10: 66.3 mg/L. Bluegill sunfish: 96-hr. LC50=220 mg/L; Water flea: 24-hr. LC50=2270 mg/L; No observed effect level:1550 mg/L.
- **Environmental:** Terrestrial: Expected to evaporate from near surface soil into the atmosphere; expected to leach. Aquatic: Primarily lost by evaporation to the atmosphere which should take several hours depending on wind and mixing conditions. Atmospheric: Will degrade by reaction with hydroxyl radicals with a half life of several months. Dichloromethane is reported to completely biodegrade under aerobic conditions with sewage seed or activated sludge between 6 hours to 7 days. Not expected to bioconcentrate due to its low octanol/water coefficient.
- **Physical:** No information available.
- **Other:** No information available.

Section 13, Disposal considerations

- Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
- **RCRA P-Series:** None listed.
- **RCRA U-Series:**
 - CAS# 75-09-2: waste number U080.

Section 14, Transport information

	US DOT	Canada TDG
Shipping Name:	DICHLOROMETHANE	DICHLOROMETHANE
Hazard Class:	6.1	6.1
UN Number:	UN1593	UN1593
Packing Group:	III	III

Section 15, Regulatory information

- **US FEDERAL**
 - **TSCA**
 - CAS# 75-09-2 is listed on the TSCA inventory.
 - **Health & Safety Reporting List**
 - CAS# 75-09-2: Effective 10/4/82, Sunset 10/4/92
 - **Chemical Test Rules**
 - None of the chemicals in this product are under a Chemical Test Rule.
 - **Section 12b**
 - CAS# 75-09-2: Section 4, 0.1 % de minimus concentration
 - **TSCA Significant New Use Rule**
 - None of the chemicals in this material have a SNUR under TSCA.
 - **CERCLA Hazardous Substances and corresponding RQs**
 - CAS# 75-09-2: 1000 lb final RQ; 454 kg final RQ
 - **SARA Section 302 Extremely Hazardous Substances**
 - None of the chemicals in this product have a TPQ.
 - **SARA Codes**

- CAS # 75-09-2: immediate, delayed.
 - **Section 313**
 - This material contains Methylene chloride (CAS# 75-09-2, >99.5%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
 - **Clean Air Act:**
 - CAS# 75-09-2 is listed as a hazardous air pollutant (HAP).
 - This material does not contain any Class 1 Ozone depletors.
 - This material does not contain any Class 2 Ozone depletors.
 - **Clean Water Act:**
 - None of the chemicals in this product are listed as Hazardous Substances under the CWA. CAS# 75-09-2 is listed as a Priority Pollutant under the Clean Water Act. CAS# 75-09-2 is listed as a Toxic Pollutant under the Clean Water Act.
 - **OSHA:**
 - None of the chemicals in this product are considered highly hazardous by OSHA.
 - **STATE**
 - CAS# 75-09-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
 - **California Prop 65:** The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:
 - WARNING: This product contains Methylene chloride, a chemical known to the state of California to cause cancer.
 - California No Significant Risk Level: CAS# 75-09-2: 200 æg/day NSRL (inhalation); 50 æg/day NSRL (except inhalation)
- **European/International Regulations**
 - European Labeling in Accordance with EC Directives
 - **Hazard Symbols:**
 - XN
 - **Risk Phrases:**
 - R 40 Limited evidence of a carcinogenic effect.
 - **Safety Phrases:**
 - S 23 Do not inhale gas/fumes/vapor/spray.
 - S 24/25 Avoid contact with skin and eyes.
 - S 36/37 Wear suitable protective clothing and gloves.
 - **WGK (Water Danger/Protection)**
 - CAS# 75-09-2: 2
 - **Canada - DSL/NDSL**
 - CAS# 75-09-2 is listed on Canada's DSL List.
 - **Canada - WHMIS**
 - This product has a WHMIS classification of D2A.
 - This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
 - **Canadian Ingredient Disclosure List**
 - CAS# 75-09-2 is listed on the Canadian Ingredient Disclosure List.

Section 16, Other Information

The information accumulated herein is believed to be accurate but is not warranted to be whether origination with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Gyros Protein Technologies.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15(29 CFR 1910.1200(g)(2)).