

Material Safety Data Sheet

| HAZARD WARNINGS | RISK PHRASES | PROTECTIVE CLOTHING |
|-----------------|---|---------------------|
| | Combustible material; avoid heat and sources of ignition. POSSIBLE TERATOGEN. MINIMIZE EXPOSURE. Harmful compound, minimize exposure. Hygroscopic -- keep container tightly sealed. Store under nitrogen. | |

| Section I. Chemical Product and Company Identification | |
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| Chemical Name | Diethylene Glycol Dimethyl Ether |
| Catalog Number | B0498 |
| Synonym | Bis(2-methoxyethyl) Ether |
| Chemical Formula | C ₆ H ₁₄ O ₃ |
| CAS Number | 111-96-6 |
| Supplier | TCI America 9211 N. Harborside St. Portland OR 1-800-423-8616 |
| In case of Emergency Call | Chemtrec® (800) 424-9300 (U.S.) (703) 527-3887 (International) |

| Section II. Composition and Information on Ingredients | | | | |
|--|------------|----------------|---|---|
| Chemical Name | CAS Number | Percent (%) | TLV/PEL | Toxicology Data |
| Diethylene Glycol Dimethyl Ether | 111-96-6 | Min. 99.0 (GC) | This compound is classified as a possible teratogen. There is no acceptable exposure limit for a teratogen. | Rat LD ₅₀ (oral) 5400 mg/kg Rat LD ₅₀ (oral) 6000 mg/kg Mouse LDLO (oral) 500 mg/kg |

| Section III. Hazards Identification | |
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| Acute Health Effects | Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound. |
| Chronic Health Effects | CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. DEVELOPMENTAL TOXICITY: Rat- TClO - ROUTE: Inhalation; DOSE: 1100 ppm/6H; DURATION: male 2W prior to mating TOXIC EFFECTS: Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count) Paternal Effects - Testes, epididymis, sperm duct Rat- TDLo - ROUTE: Oral; DOSE: 500 mg/kg; DURATION: female 11D of pregnancy TOXIC EFFECTS: Effects on Embryo or Fetus - Maternal-fetal exchange Rat- TDLo - ROUTE: Oral; DOSE: 13680 mg/kg; DURATION: male 20D prior to mating TOXIC EFFECTS: Paternal Effects -Spermatogenesis (including genetic material, sperm morphology, motility, and count) Paternal Effects - Testes, epididymis, sperm duct Paternal Effects - Other effects on male Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions. |

| Section IV. First Aid Measures | |
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| Eye Contact | Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention. |
| Skin Contact | In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention. |
| Inhalation | If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve. |
| Ingestion | INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. |

| Section V. Fire and Explosion Data | | | |
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| Flammability | Combustible. | Auto-Ignition | 190 °C (374 °F) |
| Flash Points | 55 °C (131 °F). : 70 °C (158 °F). | Flammable Limits | LOWER: 1.5% UPPER: 17.4% |
| Combustion Products | These products are toxic carbon oxides (CO, CO ₂). | | |
| Fire Hazards | Not available. | | |

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Emergency phone number (800) 424-9300

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| Explosion Hazards | Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. |
| Fire Fighting Media and Instructions | Combustible liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Consult with local fire authorities before attempting large scale fire-fighting operations. |

Section VI. Accidental Release Measures

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| Spill Cleanup Instructions | Combustible material. Possible teratogenic material. Harmful material. Hygroscopic material. Store under nitrogen. Keep away from heat. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Consult federal, state, and/or local authorities for assistance on disposal. |
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Section VII. Handling and Storage

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| Handling and Storage Information | COMBUSTIBLE. POSSIBLE TERATOGEN. HARMFUL. HYGROSCOPIC. STORE UNDER NITROGEN. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. Do not breathe gas/fumes/ vapor/spray. |
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Section VIII. Exposure Controls/Personal Protection

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| Engineering Controls | Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location. |
| Personal Protection | Splash goggles. Lab coat. Vapor respirator. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent. |
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| Exposure Limits | This compound is classified as a possible teratogen. There is no acceptable exposure limit for a teratogen. |

Section IX. Physical and Chemical Properties

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| Physical state @ 20°C | Liquid. (Clear colorless) | Solubility | Miscible with: Water, Alcohol, Ether. |
| Specific Gravity | 0.95 (water=1) | | |
| Molecular Weight | 134.17 | Partition Coefficient | LOG P _{ow} -0.42 |
| Boiling Point | 162°C (323.6°F) | Vapor Pressure | 0.4 kPa (@ 20°C) |
| Melting Point | -68°C (-90.4°F) | Vapor Density | 4.6 (Air = 1) |
| Refractive Index | Not available. | Volatility | 100% (v/v). |
| Critical Temperature | Not available. | Odor | Ethereal. (Slight.) |
| Viscosity | Dynamic: 1.089 cP | Taste | Not available. |

Section X. Stability and Reactivity Data

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| Stability | This material is stable if stored under proper conditions. (See Section VII for instructions) |
| Conditions of Instability | Avoid excessive heat and light. |
| Incompatibilities | Reactive with strong oxidizing agents, strong acids, strong alkalis (bases), moisture. |

Section XI. Toxicological Information

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| RTECS Number | KN3339000 |
| Routes of Exposure | Eye Contact. Ingestion. Inhalation. |
| Toxicity Data | Rat LD ₅₀ (oral) 5400 mg/kg Rat LD ₅₀ (oral) 6000 mg/kg Mouse LDLO (oral) 500 mg/kg |
| Chronic Toxic Effects | CARCINOGENIC EFFECTS : Not available. MUTAGENIC EFFECTS : Not available. TERATOGENIC EFFECTS : Not available. DEVELOPMENTAL TOXICITY: Rat- TCLo - ROUTE: Inhalation; DOSE:1100 ppm/6H; DURATION: male 2W prior to mating TOXIC EFFECTS: Paternal Effects - Spermatogenesis (including genetic material, sperm morphology, motility, and count) Paternal Effects - Testes, epididymis, sperm duct Rat- TDLo - ROUTE: Oral; DOSE: 500 mg/kg; DURATION: female 11D of pregnancy TOXIC EFFECTS: Effects on Embryo or Fetus - Maternal-fetal exchange Rat- TDLo - ROUTE: Oral; DOSE: 13680 mg/kg; DURATION: male 20D prior to mating TOXIC EFFECTS: Paternal Effects -Spermatogenesis (including genetic material, sperm morphology, motility, and count) Paternal Effects - Testes, epididymis, sperm duct Paternal Effects - Other effects on male |

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Emergency phone number (800) 424-9300

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|---------------------|--|
| Acute Toxic Effects | Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions. Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound. |
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Section XII. Ecological Information

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| Ecotoxicity | Not available. |
| Environmental Fate | Diethylene glycol dimethyl ether's production and use as a solvent and an anhydrous reaction medium for organo-metallic synthesis or as a solubilizer may result in its release to the environment through various waste streams. If released to air, a vapor pressure of 2.96 mm Hg at 25 deg C indicates diethylene glycol dimethyl ether will exist solely as a vapor in the atmosphere. Vapor-phase diethylene glycol dimethyl ether will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 22 hours. Diethylene glycol dimethyl ether does not contain chromophores that absorb at wavelengths >290 nm and therefore is not expected to be susceptible to direct photolysis by sunlight. If released to soil, diethylene glycol dimethyl ether is expected to have very high mobility based upon an estimated Koc of 15. Volatilization from moist soil surfaces is not expected to be an important fate process based upon an estimated Henry's Law constant of 5.2X10 ⁻⁷ atm-cu m/mole. Diethylene glycol dimethyl ether may volatilize from dry soil surfaces based upon its vapor pressure. Biodegradation of diethylene glycol dimethyl ether in soil and water may be an important environmental fate process based on a study done where it was degraded 33% after 25 days and a 7 day lag period using an activated sludge from an industry producing the chemical. If released into water, diethylene glycol dimethyl ether is not expected to adsorb to suspended solids and sediment based upon the estimated Koc. Volatilization from water surfaces is not expected to be an important fate process based upon this compound's estimated Henry's Law constant. An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions. Occupational exposure to diethylene glycol dimethyl ether may occur through inhalation and dermal contact with this compound at workplaces where diethylene glycol dimethyl ether is produced or used. Monitoring data indicate that the general population may be exposed to diethylene glycol dimethyl ether via inhalation of vehicle exhaust and ingestion of contaminated drinking water. (SRC) [Peer Reviewed] |

Section XIII. Disposal Considerations

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| Waste Disposal | Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance. |
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Section XIV. Transport Information

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| DOT Classification | CLASS 3: Flammable liquid |
| PIN Number | UN3271 |
| Proper Shipping Name | Ethers, n.o.s. |
| Packing Group (PG) | III |
| DOT Pictograms | |



Section XV. Other Regulatory Information and Pictograms

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| TSCA Chemical Inventory (EPA) | This compound is ON the EPA Toxic Substances Control Act (TSCA) inventory list. |
| WHMIS Classification (Canada) | On DSL. |
| EINECS Number (EEC) | 203-924-4 |
| EEC Risk Statements | R10- Flammable. R18- In use, may form flammable/explosive vapor-air mixture. R47- May cause birth defects. R60- May impair fertility. |
| Japanese Regulatory Data | ENCS No. 2-434; 7-1321 |

Section XVI. Other Information

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Notice to Reader

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.