Material Safety Data Sheet
Bis(2-methoxyethyl) Ether

ACC# 07320

Section 1 - Chemical Product and Company Identification

MSDS Name: Bis(2-methoxyethyl) Ether
Catalog Numbers: NC9289402, O1471-4, O1471-500, XXO1471208LI
Synonyms: 2-Methoxyethyl ether; Diglyme; Diethylene glycol dimethyl ether; DGME; Bis(2-methoxyethyl) ether.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
111-96-6	2-Methoxyethyl ether	>99	203-924-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 55 deg C.
Warning! Flammable liquid and vapor. Harmful if inhaled. May cause respiratory tract irritation. Possible risk of impaired fertility. May cause eye and skin irritation. Possible risk of harm to the unborn child. This material has been reported to be susceptible to autoxidation and therefore should be classified as peroxidizable. May form explosive peroxides. May cause central nervous system depression. This substance has caused adverse reproductive and fetal effects in animals. Hygroscopic (absorbs moisture from the air).
Target Organs: Central nervous system, reproductive system.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression.
Inhalation: May cause respiratory tract irritation. Exposure produces central nervous system depression. Subchronic toxicity was evaluated in rats exposed nose-only by inhalation to diglyme 5 days/week for 2 weeks. Testicular atrophy and exfoliated degenerative germ cells were observed among the rats exposed to 98 ppm.
Chronic: May cause reproductive and fetal effects.

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. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. May accumulate static electricity.
Extinguishing Media: Use water spray, dry chemical, or carbon dioxide.
Flash Point: 55 deg C (131.00 deg F)
Autoignition Temperature: 170 deg C (338.00 deg F)
Explosion Limits, Lower:1.5
Upper: 17.4
NFPA Rating: (estimated) Health: 1; Flammability: 2; Instability: 1

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. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Section 7 - Handling and Storage

Handling: Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. If peroxide formation is suspected, do not open or move container. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat and flame. Avoid breathing vapor or mist.
Storage: Keep away from heat, sparks, and flame. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Storage under a nitrogen blanket has been recommended. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals. All peroxidizable substances should be stored away from heat and light and be protected from ignition sources.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
2-Methoxyethyl ether	none listed	none listed	none listed

OSHA Vacated PELs: 2-Methoxyethyl ether: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: ethereal odor
pH: Not available.
Vapor Pressure: 3.0 mm Hg @ 25 deg C
Vapor Density: 4.62 (Air=1)
Evaporation Rate:0.36 (butyl acetate=1)
Viscosity: 1.14 mPa s 20 C
Boiling Point: 162 deg C @ 760 mmHg
Freezing/Melting Point:-64 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density:.9370
Molecular Formula:C6H14O3
Molecular Weight:134.18

Section 10 - Stability and Reactivity

Chemical Stability: Under normal storage conditions, peroxidizable compounds can form and accumulate peroxides which may explode when subjected to heat or shock. This material is most hazardous when peroxide levels are concentrated by distillation or evaporation.
Conditions to Avoid: High temperatures, light, ignition sources, exposure to air, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, sulfuric acid, isocyanates, perchloric acid, metal halides.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 111-96-6: KN3339000
LD50/LC50:
CAS# 111-96-6:
Oral, mouse: LD50 = 6 gm/kg;
Oral, rat: LD50 = 5400 mg/kg;
.

Carcinogenicity:

CAS# 111-96-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: Experiments in mice showed diglyme capable of producing birth defects, particularly involving the paws but also affecting many major organ systems. These effects were noted in the absence of maternal toxicity with doses as low as 125 mg/kg/day.
Reproductive Effects: As is the case for some other glycol ethers, diglyme produces testicular toxicity in rats, producing degeneration of spermatocytes. This effect, which is mediated by the methoxyacetic acid metabolite, appears to be reversible.
Mutagenicity: See actual entry in RTECS for complete information.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: This compound is unbiodegradable or biodegrades very slowly in the environment.
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: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ETHERS, N.O.S.	No information available.
Hazard Class:	3	
UN Number:	UN3271	
Packing Group:	III	

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 111-96-6 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 111-96-6: immediate, delayed, fire.
Section 313
This material contains 2-Methoxyethyl ether (listed as Glycol ethers), >99%, (CAS# 111-96-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act:
CAS# 111-96-6 (listed as Glycol ethers (except for EGBE)) 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.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 111-96-6 can be found on the following state right to know lists: California, New Jersey, (listed as Glycol ethers), Pennsylvania, (listed as Glycol ethers).

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives

Hazard Symbols:
T
Risk Phrases:
R 10 Flammable.
R 19 May form explosive peroxides.
R 60 May impair fertility.
R 61 May cause harm to the unborn child.

Safety Phrases:
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)
CAS# 111-96-6: 1
Canada - DSL/NDSL
CAS# 111-96-6 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of B3, 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# 111-96-6 is not listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 5/01/1998
Revision #7 Date: 6/06/2006