

MATERIAL SAFETY DATA SHEET

Date Printed: 08/06/2008

Date Updated: 07/19/2007

Version 1.9

Section 1 - Product and Company Information

Product Name 2-METHOXYETHANOL, >=99.3%,
SPECTROPHOTOMETRIC GRADE
Product Number 156205
Brand ALDRICH
Company Sigma-Aldrich
Address 3050 Spruce Street
SAINT LOUIS MO 63103 US
Technical Phone: 800-325-5832
Fax: 800-325-5052
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
2-METHOXYETHANOL	109-86-4	Yes

Formula C3H8O2
Synonyms Aethylenglykol-monomethylaether (German) *
Dowanol 7 * Dowanol EM * Ether monomethylique de
l'ethylene-glycol (French * Ethylene glycol
methyl ether * Glycol ether EM * Glycolmethyl
ether * Glycol monomethyl ether * Jeffersol EM *
2-Methoxy-aethanol (German) * Methoxyethanol *
2-Methoxyethanol (ACGIH:OSHA) *
Methoxyhydroxyethane * Methyl cellosolve (OSHA) *
Methylcelosolv (Czech) * Methyl ethoxol * Methyl
glycol * Methylglykol (German) * Methyl oxitol *
Metil cellosolve (Italian) * Metoksyetylowy
alkohol (Polish) * 2-Metossietanolo (Italian) *
Monomethyl ether of ethylene glycol * Poly-Solv
EM * Prist
RTECS Number: KL5775000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Combustible (USA) Flammable (EU). Toxic.
May impair fertility. May cause harm to the unborn child. Harmful
by inhalation, in contact with skin and if swallowed. Irritating
to eyes, respiratory system and skin.
Target organ(s): Blood. Kidneys. Calif. Prop. 65 developmental
hazard.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 2
REACTIVITY: 0

NFPA RATING

HEALTH: 2

FLAMMABILITY: 2
REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

EXPLOSION HAZARDS

Forms explosive mixtures in air.

FLASH POINT

104 °F 40 °C Method: closed cup

EXPLOSION LIMITS

Lower: 2.5 % Upper: 24.5 %

AUTOIGNITION TEMP

287 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.
Combustible liquid.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Shut off all sources of ignition. Evacuate area and keep personnel upwind.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Molecular Weight	76.1 AMU	
pH	5.0 - 7.0	25 °C
BP/BP Range	124.0 - 125.0 °C	760 mmHg
MP/MP Range	- 85.0 °C	
Freezing Point	- 86.0 °C	
Vapor Pressure	6.17 mmHg	20 °C
Vapor Density	2.62 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.964 g/cm3	
Bulk Density	N/A	
Odor Threshold	2.3 ppm	
Volatile%	> 99 %	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	Log Kow: - 0.8	
Decomposition Temp.	204.00 - 232.00 °C	
Flash Point	104 °F 40 °C	Method: closed cup
Explosion Limits	Lower: 2.5 % Upper: 24.5 %	
Flammability	N/A	
Autoignition Temp	287 °C	
Refractive Index	1.402	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:Soluble.	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions to Avoid: Heat. 45°C

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: Harmful if absorbed through skin.

Eye Contact: Causes eye irritation.

Inhalation: Harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion: Harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Blood. Kidneys. Bone marrow. Liver. Lungs. Central nervous system. Male reproductive system. Immune system. Thymus.

SIGNS AND SYMPTOMS OF EXPOSURE

In laboratory studies with this material, birth defects,

fetotoxicity, embryoletality, anemia, bone marrow damage, hemolysis, immunosuppression, and damage to the male reproductive tissues have been observed.

TOXICITY DATA

Oral

Rat

4,900 mg/kg

LD50

Skin

Rabbit

2,400 mg/kg

LD50

Inhalation

Rat

1,500 ppm

LC50

Oral

Human

3380 mg/kg

LDLO

Remarks: Kidney, Ureter, Bladder:Other changes. Liver:Other changes. Gastrointestinal:Gastritis.

Oral

Rat

2370 mg/kg

LD50

Remarks: Behavioral:Altered sleep time (including change in righting reflex). Lungs, Thorax, or Respiration:Other changes.

Inhalation

Rat

1,500 ppm

LC50

Intraperitoneal

Rat

2500 MG/KG

LD50

Intravenous

Rat

2068 MG/KG

LD50

Remarks: Blood:Other hemolysis with or without anemia.

Oral

Mouse

2560 mg/kg

LD50

Remarks: Cardiac:Other changes. Behavioral:Change in motor activity (specific assay). Behavioral:Somnolence (general depressed activity).

Inhalation

Mouse

1,480 ppm

LC50

Remarks: Kidney, Ureter, Bladder:Hematuria. Lungs, Thorax, or Respiration:Dyspnea. Behavioral:Analgesia.

Intraperitoneal

Mouse

2147 MG/KG

LD50

Remarks: Blood:Changes in spleen. Kidney, Ureter,
Bladder:Changes in both tubules and glomeruli. Blood:Other
changes.

Oral

Rabbit

890 mg/kg

LD50

Remarks: Behavioral:General anesthetic. Blood:Other hemolysis
with or without anemia.

Skin

Rabbit

1280 mg/kg

LD50

Oral

Guinea pig

950 mg/kg

LD50

Remarks: Kidney, Ureter, Bladder:Other changes.
Gastrointestinal:Other changes. Behavioral:General anesthetic.

IRRITATION DATA

Skin

Rabbit

483 mg

24H

Remarks: Mild irritation effect

Eyes

Rabbit

97 mg

Eyes

Rabbit

500 mg

24H

Remarks: Mild irritation effect

Eyes

Guinea pig

0.01 mg

Remarks: Mild irritation effect

CHRONIC EXPOSURE - TERATOGEN

Result: May cause congenital malformation in the fetus.

Species: Rat

Dose: 175 MG/KG

Route of Application: Oral

Exposure Time: (7-13D PREG)

Result: Specific Developmental Abnormalities: Cardiovascular
(circulatory) system.

Species: Rat

Dose: 1 GM/KG
Route of Application: Skin
Exposure Time: (12D PREG)
Result: Specific Developmental Abnormalities: Gastrointestinal system. Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 330 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (12D PREG)
Result: Specific Developmental Abnormalities: Cardiovascular (circulatory) system. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 190 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (14D PREG)
Result: Specific Developmental Abnormalities: Urogenital system. Specific Developmental Abnormalities: Central nervous system.

Species: Rat
Dose: 190 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (12D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 250 MG/KG
Route of Application: Oral
Exposure Time: (13D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 175 MG/KG
Route of Application: Oral
Exposure Time: (11D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 250 MG/KG
Route of Application: Oral
Exposure Time: (11D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 50 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Urogenital system. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 1200 MG/KG

Route of Application: Subcutaneous
Exposure Time: (7-13D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 250 MG/KG
Route of Application: Subcutaneous
Exposure Time: (8D PREG)
Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Specific Developmental Abnormalities: Central nervous system.

Species: Mouse
Dose: 250 MG/KG
Route of Application: Intravenous
Exposure Time: (8D PREG)
Result: Specific Developmental Abnormalities: Central nervous system.

Species: Monkey
Dose: 633 MG/KG
Route of Application: Oral
Exposure Time: (20-45D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rabbit
Dose: 50 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-18D PREG)
Result: Specific Developmental Abnormalities: Urogenital system. Specific Developmental Abnormalities: Body wall. Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Rabbit
Dose: 50 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-18D PREG)
Result: Specific Developmental Abnormalities: Body wall. Specific Developmental Abnormalities: Musculoskeletal system. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 150 MMOL/L
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Rat
Route: Oral
Dose: 500 MG/KG
Mutation test: Dominant lethal test

Species: Rat
Route: Oral
Dose: 500 MG/KG
Mutation test: sperm

Species: Mouse

Route: Oral
Dose: 500 MG/KG
Mutation test: sperm

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: May cause reproductive disorders.

Species: Rat
Dose: 175 MG/KG
Route of Application: Oral
Exposure Time: (7-13D PREG)
Result: Effects on Newborn: Biochemical and metabolic. Maternal
Effects: Parturition.

Species: Rat
Dose: 15015 MG/KG
Route of Application: Oral
Exposure Time: (13W MALE)
Result: Paternal Effects: Spermatogenesis (including genetic
material, sperm morphology, motility, and count).

Species: Rat
Dose: 100 MG/KG
Route of Application: Oral
Exposure Time: (1D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat
Dose: 350 MG/KG
Route of Application: Oral
Exposure Time: (9-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death,
e.g., stunted fetus). Effects on Fertility: Litter size (e.g.; #
fetuses per litter; measured before birth). Specific
Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Rat
Dose: 68 MG/KG/4H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g.,
reduction in number of implants per female; total number of
implants per corpora lutea). Effects on Fertility:
Post-implantation mortality (e.g., dead and/or resorbed implants
per total number of implants).

Species: Rat
Dose: 30 PPM/6H
Route of Application: Inhalation
Exposure Time: (65D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat
Dose: 100 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-17D PREG)
Result: Maternal Effects: Parturition. Effects on Fertility:
Female fertility index (e.g., # females pregnant per # sperm
positive females; # females pregnant per # females mated).
Effects on Newborn: Live birth index (# fetuses per litter;
measured after birth).

Species: Rat
Dose: 100 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-17D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Rat
Dose: 30 PPM/6H
Route of Application: Inhalation
Exposure Time: (13W MALE)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 11592 MG/KG
Route of Application: Skin
Exposure Time: (6-17D PREG)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated). Effects on Embryo or Fetus: Fetal death.

Species: Rat
Dose: 4375 MG/KG
Route of Application: Skin
Exposure Time: (7D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Paternal Effects: Testes, epididymis, sperm duct. Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

Species: Rat
Dose: 2 GM/KG
Route of Application: Skin
Exposure Time: (10D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 190 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (8D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 600 MG/KG
Route of Application: Subcutaneous
Exposure Time: (6-20D PREG)
Result: Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive). Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).

Species: Rat
Dose: 440 MG/KG
Route of Application: Subcutaneous
Exposure Time: (7-17D PREG)
Result: Effects on Newborn: Live birth index (# fetuses per litter; measured after birth).

Species: Mouse
Dose: 2 GM/KG
Route of Application: Oral
Exposure Time: (7-14D PREG)
Result: Specific Developmental Abnormalities: Central nervous system. Effects on Embryo or Fetus: Fetal death. Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Mouse
Dose: 500 MG/KG
Route of Application: Oral
Exposure Time: (9D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse
Dose: 6250 MG/KG
Route of Application: Oral
Exposure Time: (25D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Mouse
Dose: 1000 PPM/6H
Route of Application: Inhalation
Exposure Time: (11D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Mouse
Dose: 500 PPM/7H
Route of Application: Inhalation
Exposure Time: (5D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Species: Mouse
Dose: 50 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Urogenital system. Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Mouse
Dose: 3200 MG/KG
Route of Application: Subcutaneous
Exposure Time: (7-14D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Monkey
Dose: 930 MG/KG
Route of Application: Oral
Exposure Time: (20-45D PREG)
Result: Effects on Embryo or Fetus: Fetal death. Effects on Fertility: Abortion.

Species: Rabbit

Dose: 300 PPM/6H
Route of Application: Inhalation
Exposure Time: (65D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Rabbit
Dose: 10 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-18D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Guinea pig
Dose: 6250 MG/KG
Route of Application: Oral
Exposure Time: (25D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Guinea pig
Dose: 65 GM/KG
Route of Application: Skin
Exposure Time: (65D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Hamster
Dose: 1562 MG/KG
Route of Application: Oral
Exposure Time: (25D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 16,000 mg/l

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: 10,000 mg/l

Test Type: LC50 Fish
Species: Daphnia magna
Time: 24 h
Value: 10,000 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 24 h
Value: 10,000 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations. This combustible material may be burned in a chemical incinerator equipped with an afterburner and

scrubber.

Section 14 - Transport Information

DOT

Proper Shipping Name: Ethylene glycol monomethyl ether
UN#: 1188
Class: 3
Packing Group: Packing Group III
Hazard Label: Flammable liquid
PIH: Not PIH

IATA

Proper Shipping Name: Ethylene glycol monomethyl ether
IATA UN Number: 1188
Hazard Class: 3
Packing Group: III

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: T
Indication of Danger: Toxic.
R: 60-61-10-20/21/22
Risk Statements: May impair fertility. May cause harm to the unborn child. Flammable. Also harmful by inhalation, in contact with skin and if swallowed.
S: 53-45
Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Combustible (USA) Flammable (EU). Toxic.
Risk Statements: May impair fertility. May cause harm to the unborn child. Harmful by inhalation, in contact with skin and if swallowed. Irritating to eyes, respiratory system and skin.
Safety Statements: Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
US Statements: Target organ(s): Blood. Kidneys. Calif. Prop. 65 developmental hazard.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes
DEMINIMIS: 1 %
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause male developmental toxicity.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.