

## MATERIAL SAFETY DATA SHEET

Date Printed: 05/24/2004

Date Updated: 03/07/2004

Version 1.9

## Section 1 - Product and Company Information

Product Name	DI (ETHYLENE GLYCOL), 99%
Product Number	H26456
Brand	ALDRICH
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS MO 63103 US
Technical Phone:	314 771 5765
Emergency Phone:	414 273 3850 Ext. 5996
Fax:	800 325 5052

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
DI (ETHYLENE GLYCOL)	111-46-6	No
Formula	C4H10O3	
Synonyms	Bis(2-hydroxyethyl) ether * Brecolane ndg * Deactivator E * DEG * Dicol * Diethylenglykol (Czech) * Diglycol * Dihydroxydiethyl ether * beta,beta'-Dihydroxydiethyl ether * 2,2'-Dihydroxyethyl ether * Dissolvant APV * Ethanol, 2,2'-oxydi- * Ethylene diglycol * 3-Oxapentane-1,5-diol * 3-Oxa-1,5-pentanediol * 2,2'-Oxybisethanol * 2,2'-Oxydiethanol * 2,2'-Oxyethanol * TL4N	
RTECS Number:	ID5950000	

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Harmful.

Harmful if swallowed.

Target organ(s): Liver. Kidneys.

## HMIS RATING

HEALTH: 1\*

FLAMMABILITY: 1

REACTIVITY: 1

## NFPA RATING

HEALTH: 1

FLAMMABILITY: 1

REACTIVITY: 1

\*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 not breathing give artificial respiration. If breathing is difficult, give oxygen.

#### DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

#### 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

---

#### FLASH POINT

253.4 °F    123 °C    Method: closed cup

#### EXPLOSION LIMITS

Lower: 2 %    Upper: 12.3 %

#### AUTOIGNITION TEMP

228 °C

#### FLAMMABILITY

N/A

#### EXTINGUISHING MEDIA

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

#### 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.

---

### Section 6 - Accidental Release Measures

---

#### PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

#### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

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

#### METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

---

### Section 7 - Handling and Storage

---

#### HANDLING

User Exposure: Avoid prolonged or repeated exposure. Do not breathe vapor. Avoid contact with eyes, skin, and clothing.

#### STORAGE

Suitable: Keep tightly closed.

SPECIAL REQUIREMENTS

Hygroscopic.

---

Section 8 - Exposure Controls / PPE

---

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Government approved respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	10 MG/M3
Poland		NDSch	-
Poland		NDSP	-

---

Section 9 - Physical/Chemical Properties

---

Appearance	Physical State: Liquid	
Property	Value	At Temperature or Pressure
Molecular Weight	106.12 AMU	
pH	5 - 8	20 °C Concentration: 500 g/l
BP/BP Range	125 - 126 °C	11 mmHg
MP/MP Range	-10 °C	
Freezing Point	N/A	
Vapor Pressure	0.03 mmHg	
Vapor Density	2.14 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.114 g/cm <sup>3</sup>	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	< 0.05 %	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	38 Pas	20 °C
Surface Tension	48.5 mN/m	25 °C
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	253.4 °F 123 °C	Method: closed cup
Explosion Limits	Lower: 2 % Upper: 12.3 %	
Flammability	N/A	
Autoignition Temp	228 °C	
Refractive Index	1.446	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

---

## Section 10 - Stability and Reactivity

---

### STABILITY

Stable: Stable.

Conditions to Avoid: Protect from moisture.

Materials to Avoid: Strong oxidizing agents, Strong acids.

### 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: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: May cause eye irritation.

Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: Harmful if swallowed.

### TARGET ORGAN(S) OR SYSTEM(S)

Kidneys. Liver. Central nervous system.

### SIGNS AND SYMPTOMS OF EXPOSURE

Prolonged exposure can cause: Nausea, headache, and vomiting.

Weakness. Confusion. Dizziness. Damage to the kidneys.

Unconsciousness. Convulsions. Pulmonary edema. Effects may be delayed.

### TOXICITY DATA

Oral  
Human  
1000 mg/kg  
LDLO

Oral  
Rat  
12565 mg/kg  
LD50

Intraperitoneal  
Rat  
7700 MG/KG  
LD50

Subcutaneous  
Rat  
18800 MG/KG  
LD50

Intravenous  
Rat  
6565 MG/KG  
LD50

Oral  
Mouse

23700 mg/kg

LD50

Remarks: Behavioral:General anesthetic. Behavioral:Muscle weakness. Liver:Other changes.

Intraperitoneal

Mouse

9719 MG/KG

LD50

Remarks: Lungs, Thorax, or Respiration:Chronic pulmonary edema. Kidney, Ureter, Bladder:Changes in both tubules and glomeruli. Blood:Changes in spleen.

Oral

Dog

9000 mg/kg

LD50

Oral

Cat

3300 mg/kg

LD50

Oral

Rabbit

4400 mg/kg

LD50

Remarks: Behavioral:Coma. Lungs, Thorax, or Respiration:Dyspnea. Nutritional and Gross Metabolic:Changes in:Body temperature decrease.

Skin

Rabbit

11890 mg/kg

LD50

Oral

Guinea pig

7800 mg/kg

LD50

Remarks: Behavioral:General anesthetic. Behavioral:Muscle weakness. Liver:Other changes.

#### IRRITATION DATA

Skin

Human

112 mg

3D

I

Remarks: Mild irritation effect

Skin

Rabbit

500 mg

Remarks: Mild irritation effect

Eyes

Rabbit

50 mg

Remarks: Mild irritation effect

CHRONIC EXPOSURE - CARCINOGEN

Species: Rat  
Route of Application: Oral  
Dose: 890 GM/KG  
Exposure Time: 53W  
Frequency: C  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Kidney, Ureter, Bladder: Tumors. Kidney, Ureter, Bladder: Changes in both tubules and glomeruli.

Species: Rat  
Route of Application: Subcutaneous  
Dose: 2500 MG/KG  
Exposure Time: 82W  
Frequency: I  
Result: Tumorigenic: Neoplastic by RTECS criteria. Blood: Tumors.

Species: Mouse  
Route of Application: Oral  
Dose: 420 MG/KG  
Exposure Time: 22W  
Frequency: I  
Result: Tumorigenic: Neoplastic by RTECS criteria. Blood: Tumors.

Species: Mouse  
Route of Application: Inhalation  
Dose: 4 MG/M3  
Exposure Time: 2H/30W-  
Frequency: I  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Blood: Lymphomas including Hodgkin's disease. Skin and Appendages: Other: Tumors.

Species: Mouse  
Route of Application: Subcutaneous  
Dose: 1250 MG/KG  
Exposure Time: 66W  
Frequency: I  
Result: Tumorigenic: Neoplastic by RTECS criteria. Blood: Tumors.

Species: Rat  
Route of Application: Oral  
Dose: 1752 GM/KG  
Exposure Time: 2Y  
Frequency: C  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Kidney, Ureter, Bladder: Tumors.

Species: Rat  
Route of Application: Oral  
Dose: 584 GM/KG  
Exposure Time: 2Y  
Frequency: C  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Kidney, Ureter, Bladder: Tumors.

Species: Rat  
Route of Application: Oral  
Dose: 840 MG/KG  
Exposure Time: 81W  
Frequency: I

Result: Tumorigenic:Neoplastic by RTECS criteria. Blood:Tumors.

#### CHRONIC EXPOSURE - TERATOGEN

Species: Rat  
Dose: 50 GM/KG  
Route of Application: Oral  
Exposure Time: (1-20D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat  
Dose: 76420 MG/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat  
Dose: 38212 MG/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse  
Dose: 100 GM/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Mouse  
Dose: 343 GM/KG  
Route of Application: Oral  
Exposure Time: (MULTIGENERATION)  
Result: Maternal Effects: Parturition. Effects on Embryo or Fetus: Fetal death. Effects on Newborn: Sex ratio.

Species: Mouse  
Dose: 343 GM/KG  
Route of Application: Oral  
Exposure Time: (MULTIGENERATION)  
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated ). Effects on Newborn: Other postnatal measures or effects.

Species: Mouse  
Dose: 50 GM/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Maternal Effects: Other effects.

---

#### Section 12 - Ecological Information

---

#### ACUTE ECOTOXICITY TESTS

Test Type: EC50 Daphnia  
Species: Daphnia magna

Time: 24 h  
Value: > 10,000 mg/l

Test Type: LC50 Fish  
Species: Leuciscus idus  
Time: 48 h  
Value: > 1,000 mg/l

Test Type: LC50 Fish  
Species: Carassius auratus (Goldfish)  
Time: 24 h  
Value: 5,000 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. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

---

### Section 14 - Transport Information

---

#### DOT

Proper Shipping Name: None  
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

#### IATA

Non-Hazardous for Air Transport: Non-hazardous for air transport.

---

### Section 15 - Regulatory Information

---

#### EU DIRECTIVES CLASSIFICATION

Symbol of Danger: Xn  
Indication of Danger: Harmful.  
R: 22  
Risk Statements: Harmful if swallowed.  
S: 46  
Safety Statements: If swallowed, seek medical advice immediately and show this container or label.

#### US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Harmful.  
Risk Statements: Harmful if swallowed.  
Safety Statements: If swallowed, seek medical advice immediately and show this container or label.  
US Statements: Target organ(s): Liver. Kidneys.

#### UNITED STATES REGULATORY INFORMATION

SARA LISTED: No  
TSCA INVENTORY ITEM: Yes

#### 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



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 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.