

**SIGMA-ALDRICH****Material Safety Data Sheet**

Date Printed: 06/29/2004  
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 Version 1.70

**Section 1 - Product and Company Information**

Product Name	Ethylene glycol, 99+%, spectrophotometric grade		
Product Number	293237		
Brand	Aldrich Chemical		
Company	Sigma-Aldrich		
Street Address	3050 Spruce Street		
City, State, Zip, Country	SAINT LOUIS, MO 63103 US		
Technical Phone:	314 771 5765		
Fax:	800 325 5052	Emergency Phone:	414 273 3850 Ext. 5996

**Section 2 - Composition/Information on Ingredient**

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
ETHYLENE GLYCOL	107-21-1	Yes	203-473-3	603-027-00-1
Formula Synonyms	C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> Athylenglykol (German), 1,2-Dihydroxyethane, 1,2-Ethandiol, 1,2-Ethanediol, Ethane-1,2-diol, Ethylene alcohol, Ethylene dihydrate, Ethylene glycol (ACGIH), Glycol alcohol, Lutrol-9, Macrogol 400 BPC, M.E.G., Monoethylene glycol, NCI-C00920, Norkool, Tescol, Dowtherm SR 1, Ucar 17			

**Section 3 - Hazards Identification****Emergency Overview**

Harmful.  
 Harmful if swallowed. Irritating to eyes.  
 Target organ(s): Nerves. Kidneys.

**HMIS Rating**

Health: 2\* Flammability: 1 Reactivity: 1

**NFPA Rating**

Health: 2 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 contact, immediately wash skin with soap and copious amounts of water.

**Eye Exposure**

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

**Section 5 - Fire Fighting Measures**

Flash Point:	231.8 °F	111 °C
Explosion Limits:	Lower: 3.2 %	Upper: 15.3 %
Autoglowition Temp:	400 °C	

**Extinguishing Media****Suitable**

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.

**Specific Method(s) of Fire Fighting**

Do not direct a solid stream of water at burning material as spattering may result.

**Section 6 - Accidental Release Measures****Procedure(s) of Personal Precaution(s)**

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

**Methods for Cleaning Up**

Absorb on sand or vermiculite and place in closed containers for disposal. When spilled, the floor may be slippery. Wipe up the floor completely.

**Section 7 - Handling and Storage****Handling****User Exposure**

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

**Storage****Suitable**

Keep tightly closed.

**Special Requirements**

Hygroscopic.

**Section 8 - Exposure Controls / PPE****Engineering Controls**

Mechanical exhaust required. Safety shower and eye bath.

**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	OSHA	NDS	15 MG/M3
USA		PEL	50.000 ppm
Poland		NDSCh	50 MG/M3
USA	ACGIH	TLV	100.000 mg/m3
Poland		NDSP	-

**Exposure Limits, RTECS**

Country	Source	Type	Value
USA	ACGIH	Ceiling concentration	100 MG/M3
USA	MSHA Standard-air	TWA	10 MG/M3 (PARTICULATE)
New Zealand	OEL		

**Remarks:** check ACGIH TLV

**Section 9 - Physical/Chemical Properties****Appearance**

**Physical State**  
Liquid

**Molecular Weight:** 62.07 AMU

**pH** N/A

**BP/BP Range** 195 - 197 °C

**MP/MP Range** -13 °C

**Freezing Point**

**Vapor Pressure** 0.08 mmHg

20 °C

**Vapor Density** 2.1 g/l

**Saturated Vapor Conc.** N/A

**SG/Density** 1.113 g/cm3

**Bulk Density** N/A

**Odor Threshold** N/A

**Volatile%** N/A

**VOC Content** <= 100.000 %

**Water Content** < 0.1 %

**Solvent Content** N/A

**Evaporation Rate** 1.00

**Viscosity** N/A

**Partition Coefficient** Log Kow: -1.36

**Decomposition Temp.** N/A

**Flash Point °F** 231.8 °F

**Flash Point °C** 111 °C

**Explosion Limits** Lower: 3.2 %

Upper: 15.3 %

**Flammability** N/A

**Autoglowign Temp** 400 °C

**Refractive Index** 1.431

Method: closed cup  
Method: closed cup

**Solubility**

**Solubility In Water:** Miscible.

**Solubility In Water:** complete and clear

**Solvent:** 50 mg/ml EtOH

**Other Solvents:** 50 MG/ML ETHER.

**N/A = not available**

**Section 10 - Stability and Reactivity****Stability**

**Stable**

Stable.

**Conditions to Avoid**

Heat. Protect from moisture.

**Materials to Avoid**

Strong acids, Strong oxidizing agents, Strong bases, Aldehydes, Aluminum.

**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**

Causes eye irritation.

**Inhalation**

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

**Ingestion**

Harmful if swallowed.

**Target Organ(s) or System(s)**

Central nervous system. Kidneys. Eyes. Cardiovascular system. Liver.

**Signs and Symptoms of Exposure**

When ingested early symptoms mimic alcohol inebriation and are followed by nausea, vomiting, abdominal pain, weakness, muscle tenderness, respiratory failure, convulsions, cardiovascular collapse, pulmonary edema, hypocalcemic tetany, and severe metabolic acidosis. Without treatment, death may occur in 8 to 24 hours. Victims who survive the initial toxicity period usually develop renal failure along with brain and liver damage. Exposure to and/or consumption of alcohol may increase toxic effects.

**Conditions Aggravated by Exposure**

Ethyleneglycol is metabolized to glycoaldehyde, glycolic acid, and glyoxal, followed by conversion to glyoxylic acid, formic acid, and oxalic acid. It has been shown that ethyleneglycol is much less toxic than its metabolites. Glycolic acid is thought to be the major toxic metabolite causing acute as well as reproductive and developmental toxicity observed with ethyleneglycol exposures. May cause nervous system disturbances.

**RTECS Number:** KW2975000

**Toxicity Data**

Oral - Human: LETHAL DOSE: 100 ML OR 3 OZ()

Oral - Rat: 6,000 - 13,000 mg/kg(LD50)

Oral - Human: 786 mg/kg (LDLO)