KIMYAGARAN
Emrooz
Chemical Industries Co.

Safety Data Sheet

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1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: KEDEG
Product Description: Diethylene Glycol
CAS No.: 111-46-6
Product Formulation: $HO(C_2H_4O)_2H$
Chemical Family: Glycols
Common names: 2,2'-Oxydiethanol, 2-Hydroxyethyl ether, Bis(2-hydroxyethyl) ether, Diglycol
Manufacturer: Kimyagaran Emrooz Chemical Industries Co.
Tel: +98-21-88746565
Fax: +98-21-88746564
Home Page: www.kimyagaran.com

2. HAZARDS IDENTIFICATION

Emergency overview

Appearance: colorless viscous liquid.

Caution! May cause eye and skin irritation. May be harmful if swallowed. May cause central Nervous system depression. May cause kidney damage. Hygroscopic (absorbs moisture from the Air).

Target organs: kidneys, central nervous system, liver.

Potential health effects

Eye: may cause mild eye irritation.

Skin: may cause mild skin irritation. May be absorbed through the skin. Passage of diethylene. Glycol into the body through the skin is possible, but it is unlikely that this would result in harmful Effects during safe handling and use.

Ingestion: may cause liver and kidney damage. May cause central nervous system depression, Characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to Respiratory failure. Human fatalities have been reported from acute poisoning.

Inhalation: may cause respiratory tract irritation. May be harmful if inhaled. Inhalation of Heated or misted form may cause pulmonary edema.

Chronic: adverse reproductive effects have been reported in animals. A long term rat feeding Study showed that 1% diethylene glycol in the diet over a 2-year period resulted in slight growth Depression, a few calcium oxalate bladder stones, minimal kidney damage, and occasional liver Damage. At 4% dietary level, there was increased mortality, a marked depression of growth rate, Bladder stones, severe kidney damage, and moderate liver damage. In addition, bladder tumors Appeared rather frequently.

3. COMPOSITION

Chemical Name	Wt.%	CAS No.
Diethylene glycol	100.0	111-46-6

4. FIRST AID MEASURES

Eyes: flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: if victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give Anything by mouth to an unconscious person. Get medical aid.
Inhalation: remove from exposure and move to fresh air immediately. If not breathing, give Artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to physician: treatment options include ipecac/lavage, activated charcoal, Cathartics-administered within two hours of ingestion. Hemodialysis should be considered in severe intoxication.

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.
Extinguishing media: water or foam may cause frothing. Alcohol foam, water fog, carbon Dioxide, dry chemical.

Flash point:	124 °C (255.20 °F)
Autoignition temperature:	224 °C (435.20 °F)
Explosion limits, lower:	not available.
Upper:	not available.
NFPA rating:	(estimated) health: 1; flammability: 1; instability: 0

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. Provide ventilation.

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7. HANDLING AND STORAGE

Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid breathing vapors from heated material. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Wash clothing before reuse. Avoid breathing spray or mist.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers tightly closed. Store protected from moisture.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Good general ventilation should be sufficient to control airborne levels.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Diethylene glycol	none listed	none listed.	

OSHA Vacated PELs: Diethylene glycol: 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 protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to minimize contact with skin.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Viscous liquid
Appearance:	colorless
Odor:	practically odorless
pH:	Not available.

Vapor Pressure:	0.01 mm Hg @ 30 ˚C
Vapor Density:	3.66 (Air=1)
Evaporation Rate:	< 0.001
Viscosity:	0.30 cP @ 25 ˚C
Boiling Point:	245 ˚C
Freezing/Melting Point:	-10 ˚C
Decomposition Temperature:	Not available
Solubility:	Soluble
Specific Gravity/Density:	1.11
Molecular Formula:	$C_4H_{10}O_3$
Molecular Weight:	106.12

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, strong bases.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

RTECS#:

CAS# 111-46-6: ID5950000

LD50/LC50:

CAS# 111-46-6:

Draize test, rabbit, eye: 50 mg Mild;

Draize test, rabbit, skin: 500 mg Mild;

Oral, mouse: LD50 = 23700 mg/kg;

Oral, mouse: LD50 = 2300 mg/kg;

Oral, rabbit: LD50 = 4400 mg/kg;

Oral, rat: LD50 = 12565 mg/kg;

Oral, rat: LD50 = 12000 mg/kg;

Skin, rabbit: LD50 = 11890 mg/kg;

Oral, human: LDLo = 1000 mg/kg.

Carcinogenicity:

CAS# **111-46-6:** Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: The major hazard from diethylene glycol occurs following the ingestion of relatively large single doses...105 fatalities among 353 people who ingested a solution of sulfanilamide in an aqueous mixture containing 72% diethylene glycol. The symptoms included nausea, dizziness, and pain in the kidney region. In a few days, oliguria (reduced urination) and anuria (complete suppression of urination), with death resulting from uremic poisoning (kidney failure) followed. Diethylene glycol-contaminated acetaminophen elixirs were the cause of at least 30 deaths from renal failure in Haitian children in June 1996. Delayed neurological effects including lethargy, 6th nerve palsy, dilated pupils, optic neuritis & cerebralatrophy occurred in a 71/2-year-old girl poisoned in this epidemic.

Teratogenicity: Oral, rat: TDLo = 50 gm/kg (Female 1-20 days after conception---Developmental abnormalities).

Reproductive Effects: Oral, rat: TDLo = 76420 mg/kg (Female 6-15 days after conception--Effects on embryo and fetus).; Oral, mouse: TDLo = 334 gm/kg (Multigeneration--Materal and embryonic effects).

Mutagenicity: No information found

Neurotoxicity: Rats and mice exposed to diethylene glycol at 5 mg/m3 for 3-7 months showed structural changes in CNS and endocrine and internal organs along with other pathological effects.

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12. ECOLOGICAL INFORMATION

Ecotoxicity: Fish: Fathead Minnow: LC50 = >100.0 mg/L; 96 Hr.; Static Condition Water flea Daphnia: LC50 = 0.3-1.0 mg/L; 96 Hr.; Static ConditionBacteria: Phytobacterium phosphoreum: EC50 = 228 mg/L; 15 minutes; Microtox test No data available.

Environmental: Estimated Koc value = 1. This value suggests that 2-Hydroxyethyl ether will have high mobility and be expected to biodegrade quickly in soil. It will not be expected to adsorb to suspended solids and sediments in water.

Physical: No information found.

Other: Estimated BCF value = 0.05. This value indicates that this product will exhibit low bio-concentration in aquatic organisms. Biodegradation is expected to be an important fate process in water. 2-Hydroxyethyl ether will exits primarily as a vapor in the ambient atmosphere.

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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 list

Consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

14. TRANSPORT INFORMATION

	US DOT	CANADA
TDG		
Shipping Name: Not regulated as a hazardous material		**No information available.**
Hazard Class:	**-**	**-**
UN Number:	**-**	**-**
Packing Group:	**-**	**-**

15. REGULATORY INFORMATION

US FEDERAL

TSCA

CAS# 111-46-6 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 # 111-46-6: immediate, delayed.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

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# 111-46-6 can be found on the following state right to know lists:
Pennsylvania, Minnesota.
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:

XN
Risk Phrases:
R 22 Harmful if swallowed.
Safety Phrases:
S 46 If swallowed, seek medical advice immediately and show this con
tainer or label.
WGK (Water Danger/Protection)
CAS# 111-46-6: 1
Canada - DSL/NDSL
CAS# 111-46-6 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of 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

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16. OTHER INFORMATION

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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Caution

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct since it was obtained from sources we believe are reliable. However no representation, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion.