



SAFETY DATA SHEET

(according to EC Regulation No 1907/2006)

PAGE
1

DIETHYLENE GLYCOL

Version No: 03

Date: April 2016

1. IDENTIFICATION OF CHEMICAL/SUBSTANCE AND COMPANY/UNDERTAKING

PRODUCT INFORMATION

Product Name	Diethylene Glycol
Use of substance/mixture	For producing basic organic chemicals
Manufacturer	EQUATE Petrochemicals Company (K.S.C.C.) P.O. Box 9717, Ahmadi 61008, Kuwait
Telephone Number	+965 1898888 extn 5678
Emergency Number	+965 99870572 (24 hours a day)
Email	ISCMarinePlanning@equate.com

2. HAZARDS IDENTIFICATION

Classification according to Regulation (EC) No 1272/2008



GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC



Xn ; Harmful

R22: Harmful if swallowed.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008:

The substance is classified and labelled according to the CLP regulation.

Hazard pictograms:



Signal word: Warning

GHS07

Hazard statements:

H302 Harmful if swallowed.

Precautionary statements:

P264 Wash thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P330 Rinse mouth.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.



MATERIAL SAFETY DATA SHEET

EFFECTS OF A SINGLE OVEREXPOSURE

Swallowing

Moderately high toxicity, May cause pain or discomfort in the abdomen, pain in the lumbar region, nausea, vomiting, diarrhea, dizziness, drowsiness, decreased urine production, malaise, and loss of consciousness. Severe kidney damager may occur which can be fatal if not promptly and adequately treated. Liver injury may also occur.

Skin Absorption

No evidence of harmful effects from available information

Inhalation

Short term harmful health effects are not expected from vapor generated at ambient temperature.
Vapor or mist from heated material may cause nausea and headache.

Skin Contact

No evidence of harmful effects from available information.

Eye Contact

May cause irritation, experienced as stinging with excess blinking and tear production.
Excess redness of the conjunctiva may occur.

EFFECTS OF REPEATED OVEREXPOSURE

Repeated overexposure to vapor or mist may cause headache, nausea, and dizziness.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE

A knowledge of the available tyotoxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

OTHER EFFECTS OF OVEREXPOSURE

Short-term repeated ingestion of diethylene glycol may produce renal failure

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS #	% w/w	Hazards
DiEthylene Glycol	111-46-6	99.5-100	Not Hazardous
Ethylene Glycol	107-21-1	.2	Toxic



MATERIAL SAFETY DATA SHEET

Page 3 of 8

EXPOSURE LIMITS AND TOXICOLOGICAL DATA

Diethylene Glycol

EL	:	10 mg/m ³	TWA - Aerosol	AIHA WEEL
EL	:	50 ppm	TWA - Vapor and aerosol	AIHA WEEL
LC50	:	4.4 mg/L		
LD50	:	12565 mg/kg	Oral-rat	RTECS
LC50	:	11890 mg/kg	Skin-Rabbit	RTECS

Ethylene Glycol

EL	:	39.4 ppm	Ceiling, Aerosol	ACGIH
EL	:	39.4 ppm	Ceiling, Vapor and Aerosol	Union Carbide
LC50	:	Not Available		
LD50	:	9530 ul/kg	Skin-Rabbit	RTECS

EL: Exposure Limit LC: Lethal concentration LD: Lethal Dose

Consult local authorities for recommended exposure limits.

4. FIRST AID MEASURES

SWALLOWING

If patient is fully conscious, give two glasses of water. Induce vomiting. Obtain medical attention without delay. If medical advice is delayed, and if the person has swallowed a moderate volume of material (a few ounces), then give three to four ounces of hard liquor, such as whiskey. For children, give proportionally less liquor, according to weight.

SKIN CONTACT

Wash with soap and water

INHALATION

Remove to fresh air.

EYE CONTACT

Immediately flush eyes with water and continue washing for several minutes. Remove contact lenses, if worn. Obtain medical attention.

NOTES TO PHYSICIAN

It is estimated that the lethal oral dose of diethylene Glycol to adults is of the order of 1.0-1.2 ml/kg. Diethylene glycol produces metabolites that cause an elevated anion-gap metabolic acidosis and renal tubular injury. Liver injury may occur, but not as severe as kidney injury. The signs and symptoms in diethylene glycol poisoning are those of metabolic acidosis, CNS depression and kidney injury. Urinalysis may show albuminuria, hematuria and oxaluria.

The currently recommended medical management of Diethylene Glycol poisoning includes elimination of diethylene glycol and metabolites, correction of metabolic acidosis, and prevention of kidney injury. It is essential to have immediate and follow-up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis.

For severe and/or deteriorating cases, hemodialysis may be required.



MATERIAL SAFETY DATA SHEET

Page 4 of 8

Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood Ethylene Glycol concentration greater than 25 mg/dl, or compromise of renal functions.

There are no reported cases in which ethanol has been used antidotally, although a limited number of laboratory animal studies suggest that it may be effective. If used clinically, a therapeutically effective blood concentration is probably around 100-150 mg/dl, although this is unproven; this concentration should be achieved by a rapid loading dose and maintained by intravenous infusion. One animal study has suggested that pyrazole may be an effective early antidote, but its value in human diethylene glycol poisoning is unproven.

5. FIRE FIGHTING MEASURES

Hazard Rating System:

NFPA	Health	Fire	Reactivity
	1	1	0

FLASH POINT

151.6°C, Pensky-Martens closed cup, ASTM D 93
151.6°C, Cleveland Open Cup, ASTM D 92

AUTOIGNITION TEMPERATURE

Not Available

FLAMMABLE LIMITS IN AIR, % BY VOLUME

Upper: 12.3 estimated
Lower: 2.0 calculated

HAZARDOUS COMBUSTION PRODUCTS

Burning can produce the following products:

Carbon monoxide and/or carbon dioxide

Carbon monoxide is highly toxic if inhaled; carbon dioxide is sufficient concentration can act as an asphyxiant.

If the fluid is heated above the temperature of the onset of initial decomposition, 287°C, thermal degradation may result in the formation of volatile organic compounds such as aldehydes including formaldehyde and acetaldehyde, and other potentially harmful decomposition products. Respiratory protection may be required.

EXTINGUISHING MEDIA

Apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

EXTINGUISHING MEDIA TO BE AVOIDED

None

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Use self-contained breathing apparatus, eye protection and protective clothing.

UNUSUAL FIRE AND EXPLOSIVE HAZARDS

See Section-7, „Other Precautions“

6. ACCIDENTAL RELEASE MEASURES



MATERIAL SAFETY DATA SHEET

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Small spills can be flushed with large amounts of water. Larger spills should be collected for disposal. Also prevent from reaching soil, sewers and waterway.

7. HANDLING AND STORAGE

HANDLING

General Handling Precautions

- Do not swallow.
- Avoid contact with eyes.
- Avoid prolonged or repeated breathing of aerosol and vapor.
- Use with adequate ventilation.
- Wash thoroughly after handling.

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Ventilation

General (mechanical) room ventilation is expected to be satisfactory.

STORAGE

Keep contained closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

See Section 2, "EXPOSURE LIMITS AND TOXICOLOGICAL DATA".

PERSONNEL PROTECTION

Respiratory Protection

None expected to be needed at low temperatures.

Hand Protection / Protective Gloves

Use chemical resistant gloves (eg: Nitrile or PVC). Use heat resistant gloves for thermal protection, if needed.

Eye Protection

Use Safety glasses with side shields. If exposure causes discomfort, use a full-face respirator

Other Protective Equipment

Eye bath, safety shower.

Protective clothing

Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, gloves, boots, apron or fully body-suit will depend on operation. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly.

If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. When handling hot material, protect skin from thermal burns as well as from skin absorption.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State

Liquid

Appearance

Transparent Colorless



MATERIAL SAFETY DATA SHEET

Page 6 of 8

Odor	Under normal conditions: No detectable odor Under high vapor concentrations: Mild sweet odor may be detected
Molecular Weight	106.12
Boiling Point (°C at 760 mm Hg)	245.3
Freezing Point (°C)	-9
Pour Point	Not Applicable
Melting Point	Not Applicable
Specific Gravity (H₂O = 1)	1.1182 at 20/20°C
Vapor Pressure (at 20°C)	0.002 mm Hg
Vapor Density (air=1)	3.65
Evaporation Rate (butyl acetate = 1)	<0.001
Solubility in Water (by weight)	100% at 20°C
% Volatiles	Not Available
pH	Not Available
Coefficient of Water/Oil Distribution	Not Determined

10. STABILITY AND REACTIVITY

STABILITY	Stable
Conditions to Avoid	None known
Incompatible Materials	
Explosive decomposition may occur if combined with strong acids or strong bases and subjected to elevated temperatures. Therefore, avoid strong acids and strong bases at elevated temperatures. Avoid contamination with strong oxidizing agents and materials reactive with hydroxyl compounds.	

Hazardous Decomposition Products

See Section 5, "HAZARDOUS COMBUSTION PRODUCTS".

POLYMERIZATION

Will Not Occur

Conditions to Avoid None known

11. TOXICOLOGICAL INFORMATION

A chronic dietary feeding study of diethylene glycol with rats showed mild kidney injury at 1%, while concentrations of 2% and 4% caused more marked kidney injury. In addition, at 2% and 4% of diethylene glycol in the diet, some rats developed benign papillary tumors in the urinary bladder. These have been attributed to the presence of urinary bladder calcium oxalate stones. No evidence for carcinogenicity was found with a chronic skin-painting study with diethylene glycol in mice. The absence of a direct chemical carcinogenic effect accords with the results in vitro genotoxicity studies which show that it does not produce mutagenic or clastogenic effects. A feeding study employing up to 5.0% diethylene glycol in the diet failed to produce any teratogenic effects.

In a mouse continuous breeding study with large doses of diethylene glycol in drinking water, there was evidence for reproductive toxicity at 3.5% (equivalent to 6.1 g/kg/day) as reduced number of litters, live pups per litter, and live pup weight. No such effects were seen at 1.75% (approximately 3.05 g/kg/day). The relevance of these very high dosages to human health is uncertain.



MATERIAL SAFETY DATA SHEET

Page 7 of 8

Pregnant rats receiving undiluted diethylene glycol by gavage over the period of organogenesis had toxic effects at 4.0 and 8.0 ml /kg/day as mortality, decreased body weight, decreased food consumption, increased water consumption, and increased liver and kidney weights. Foetotoxicity was seen only at these maternally toxic dosages. Decreased foetal body weight occurred at 8.0 ml/kg/day and increased skeletal variatnts at 4.0 and 8.0 ml/kg/day. No embryotoxic or teratogenic effects were seen. Neither maternal toxicity nor foetotoxicity occurred at 1.0 ml/kg/day. In a study with mice also receiving undiluted diethylene glycol over the period of organogenesis, maternal toxicociy occurred at 2.5 and 10.0 ml/kg/day but not at 0.5 ml/kg/day. Definitive developmental toxicity was not seen in this species.

12. ECOLOGICAL INFORMATION

PERSISTANCE AND DEGRADABILITY

All available ecological data have been taken into account for the development of the hazard and precautionary information contained in this Material Safety Data Sheet.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD(S)

Incinerate in a furnace where permitted under appropriate government regulations. See Section 7, „Other Precautions“.

14. TRANSPORT INFORMATION

PRIMARY CLASS	None
SUBSIDIARY CLASS	None
SHIPPING NAME	None
PACKING GROUP	None
UN	None

15. REGULATORY INFORMATION

LABEL STATEMENTS

DANGER!
HARMFUL OR FATAL IF SWALLOWED
CAUSES EYE IRRITATION
PROLONGED OR REPEATED BREATHING OF MIST OR VAPOR FROM HEATED MATERIAL IS HARMFUL.
MAY CAUSE LIVER OR KIDNEY DAMAGE.

FOR INDUSTRY USE ONLY

EINECS

The ingredients of this product are on the EINECS inventory.

TSCA

The ingredients of this product are on the TSCA inventory

DSL

The ingredients of this product are on the DSL

16. OTHER INFORMATION

Revision History:

Version3: Update UN-GHS Symbols and Revision History Added



MATERIAL SAFETY DATA SHEET

Page 8 of 8

LEGEND

TS	Trade Secret
N/A	Not Available
W/W	Weight/Weight

The opinions expressed herein are those of qualified experts within EQUATE Petrochemicals Company (K.S.C.C). We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of the use of the product are not within the control of EQUATE Petrochemicals Company (K.S.C.C.), it is the user's obligation to determine conditions of safe use of the product.