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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier

Diethylene glycol monoethyl ether, puriss, 99%+

Code: D 1741

2. Hazard identification

2.1 Classification of the substance or mixture

Not classified.

2.2 GHS label elements, including precautionary statements

Pictogram(s) No symbol.

Signal word No signal word.

Hazard statement(s) none

Precautionary statement(s)

Prevention none

Response none

Storage none

Disposal none

2.3 Other hazards which do not result in classification

none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
diethylene glycol monoethyl ether	diethylene glycol monoethyl ether	111-90-0	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest.

In case of skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower.

In case of eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

If swallowed

Rinse mouth.

4.2 Most important symptoms/effects, acute and delayed

None expected. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Minimum/Potential Fatal Human Dose

It has been estimated that the single oral dose /of diethylene glycol/ lethal for humans is approximately 1 ml/kg. /Diethylene glycols/

Absorption, Distribution and Excretion

To assist evaluation of the hazards of skin contact with selected undiluted glycol ethers, their absorption across isolated human abdominal epidermis was measured in vitro. Epidermal membranes were set up in glass diffusion cells and, following an initial determination of permeability to tritiated water, excess undiluted glycol ether was applied to the outer surface for 8 hr. The appearance of glycol ether in an aqueous receptor phase bathing the underside of the epidermis was quantified by a gas chromatographic technique. A final determination of tritiated water permeability was compared with initial values to establish any irreversible alterations in epidermal barrier function induced by contact with the glycol ethers. 2-methoxyethanol (EM) was most readily absorbed (mean steady rate 2.82 mg/sq cm/hr), and a relatively high absorption rate (1.17 mg/sq cm/hr) was also apparent for 1-methoxypropan-2-ol (PM). There was a trend of reducing absorption rate with increasing molecular weight or reducing volatility for monoethylene glycol ethers (EM, 2.82 mg/sq cm/hr; 2-ethoxyethanol, EE, 0.796 mg/sq cm/hr; 2-butoxyethanol, EB, 0.198 mg/sq cm/hr) and also within the diethylene glycol series: 2-(2-methoxyethoxy) ethanol (DM, 0.206 mg/sq cm/hr); 2-(2-ethoxyethoxy) ethanol (DE, 0.125 mg/sq cm/hr) and 2-(2-butoxyethoxy) ethanol (DB, 0.035 mg/sq cm/hr). The rate of absorption of 2-ethoxyethyl acetate (EEAc) was similar to that of the parent alcohol, EE. Absorption rates of diethylene glycol ethers were slower than their corresponding monoethylene glycol equivalents. Combination of intrinsic toxicity and ability to pass across skin contribute to assessment of hazards of contact with undiluted glycol ethers. [Dugard PH et al; Environ Health Perspect 57: 193-7 (1984)] Full text: PMC1568269

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

If material on fire or involved in fire: Use water in flooding quantities as fog. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. Use "alcohol" foam, dry chemical or carbon dioxide. Keep run-off water out of sewers and water sources.

5.2 Specific hazards arising from the chemical

This chemical is combustible.

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Collect leaking liquid in sealable containers. Wash away remainder with plenty of water.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong oxidants. Ventilation along the floor.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state colourless liquid

Colour Colorless liquid

Odour Mild, pleasant odor

Melting point/ freezing point -80\00baC

Boiling point or initial boiling point and boiling range 202\00b0C(lit.)

Flammability Combustible.

Lower and upper explosion limit / flammability limit Lower flammable limit: 1.2% by volume; Upper flammable limit:

23.5% AT 360 DEG F (182 DEG C) by volume

Flash point 96\00b0C

Auto-ignition temperature 204.44\00b0C (USCG, 1999)

Decomposition temperature no data available

pH no data available

Kinematic viscosity 3.85 mPa.s (=cPs) at 25\00b0C

Solubility In water: Miscible

Partition coefficient n-octanol/water (log value) log Kow = -0.54

Vapour pressure 0.12 mm Hg (20 \00b0C)

Density and/or relative density 0.999g/mL at 25°C (lit.)
Relative vapour density 4.63 (vs air)
Particle characteristics no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Combustible. Mixing diethylene glycol monoethyl ether in equal molar portions with any of the following substances in a closed container caused the temperature and pressure to increase: chlorosulfonic acid and oleum, NFPA 1991.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

... Can react with oxidizing materials.

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and irritating fumes.

11. Toxicological information

Acute toxicity

Oral: LD50 Rat oral 7500 mg/kg bw

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: LC50 *Pimephales promelas* (fathead minnow) 26.5 g/L/96 hr (confidence limit 24.2 to 29.0 g/L). Nominal concentrations were not reported. Individual lengths and weights of the test fish were not recorded; however, the measured mean weight was 0.151 g. /Conditions of bioassay not specified

Toxicity to daphnia and other aquatic invertebrates: LC50 *Daphnia magna* (Water flea) 1982 mg/L for 48 hr /static bioassay

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

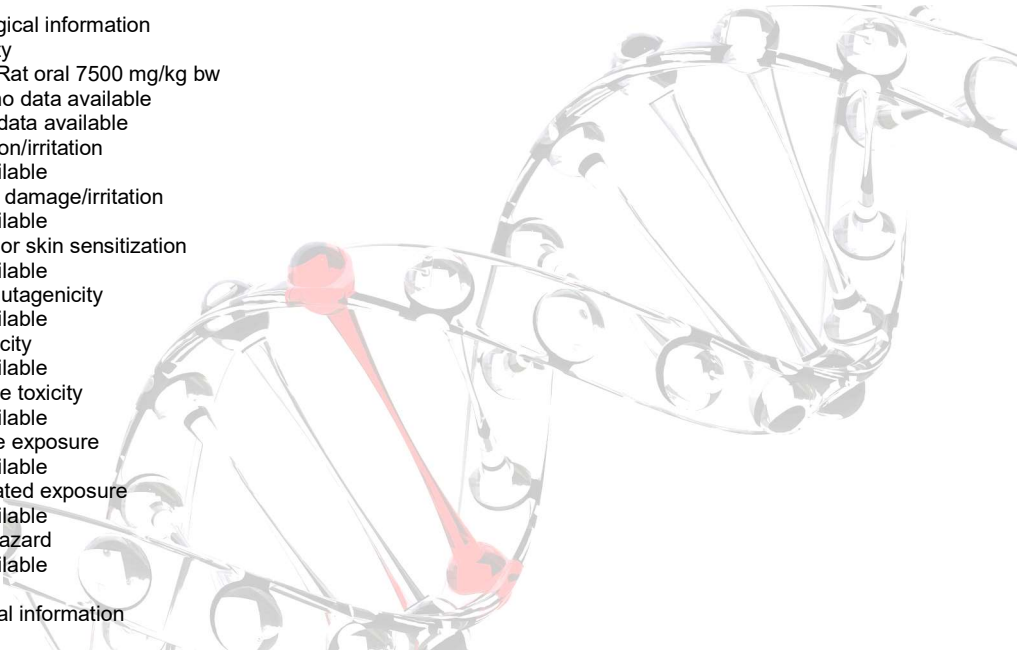
12.2 Persistence and degradability

AEROBIC: Aerobic biological screening studies, which utilized settled wastewater, sewage, or activated sludge for inocula, indicate that diethylene glycol monoethyl ether should biodegrade rapidly in the environment following an acclimation period(1-6). After a 16 day acclimation period a 39.8% BODT was recorded using an 8 hr Warburg test(5). A 5 day BOD test at 20°C showed a 34.3% loss after 16 days of acclimation(5). A second 5 day BOD test, utilizing an adapted seed inoculum exhibited a 30% BODT(1). Incubation of diethylene glycol monoethyl ether for 5, 10, and 20 days without an acclimation period resulted in BOD values, measured in % theoretical, of 5, 31, and 48, respectively(2). Diethylene glycol monoethyl ether, inoculated with wastewater, was bio-oxidized 17, 71, 75, and 87% following 5, 10, 15, and 20 days incubation, respectively; in seawater, this compound was bio-oxidized 11, 44, 57, and 70% in 5, 10, 15, and 20 days, respectively(3). According to the Zahn-Wellens screening method >90% loss of 400 ppm occurred in 28 days(4). A study using activated sludge gave a degradation rate for diethylene glycol monoethyl ether of 0.18/hour(6) giving a half-life of 3.9 hours(SRC).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for diethylene glycol monoethyl ether(SRC), using a log Kow of -0.54(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil



The Koc of diethylene glycol monoethyl ether is estimated as 12(SRC), using a log Kow of -0.54(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that diethylene glycol monoethyl ether is expected to have very high mobility in soil.

12.5 Other adverse effects
no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: Not dangerous goods. IMDG: Not dangerous goods. IATA: Not dangerous goods.

14.2 UN Proper Shipping Name

ADR/RID: unknown

IMDG: unknown

IATA: unknown

14.3 Transport hazard class(es)

ADR/RID: Not dangerous goods. IMDG: Not dangerous goods. IATA: Not dangerous goods.

14.4 Packing group, if applicable

ADR/RID: Not dangerous goods. IMDG: Not dangerous goods. IATA: Not dangerous goods.

14.5 Environmental hazards

ADR/RID: no

IMDG: no

IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
diethylene glycol monoethyl ether	diethylene glycol monoethyl ether	111-90-0	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Not Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.