SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0

Creation Date: Aug 10, 2017

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1. Identification

1.1 GHS Product identifier

Product name	2-methoxyethanol

1.2 Other means of identification

Product number	-
Other names	Ethylene glycol monomethyl ether,Methyl glycol

1.3 Recommended use of the chemical and restrictions on use

Identified uses	For industry use only. Adsorbents and absorbents,Intermediates,Solvents (which become part of product formulation or mixture)
Uses advised against	no data available

2. Hazard identification

2.1 Classification of the substance or mixture

Flammable liquids, Category 3

Acute toxicity - Oral, Category 4

Acute toxicity - Dermal, Category 4

Acute toxicity - Inhalation, Category 4

Reproductive toxicity, Category 1B

2.2 GHS label elements, including precautionary statements

Pictogram(s)	
Signal word	Danger
Hazard statement(s)	H226 Flammable liquid and vapour
	H302 Harmful if swallowed
	H312 Harmful in contact with skin
	H332 Harmful if inhaled
	H360FD
Precautionary statement(s) Prevention	
	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
	P233 Keep container tightly closed.
	P240 Ground and bond container and receiving equipment.
	P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
	P242 Use non-sparking tools.
	P243 Take action to prevent static discharges.
	P280 Wear protective gloves/protective clothing/eye protection/face protection.
	P264 Wash ... thoroughly after handling.
	P270 Do not eat, drink or smoke when using this product.
	P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
	P271 Use only outdoors or in a well-ventilated area.
	P201 Obtain special instructions before use.

	P202 Do not handle until all safety precautions have been read and understood.
Response	P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
	P370+P378 In case of fire: Use ... to extinguish.
	P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/…if you feel unwell.
	P330 Rinse mouth.
	P302+P352 IF ON SKIN: Wash with plenty of water/...
	P312 Call a POISON CENTER/doctor/…if you feel unwell.
	P321 Specific treatment (see ... on this label).
	P362+P364 Take off contaminated clothing and wash it before reuse.
	P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P308+P313 IF exposed or concerned: Get medical advice/ attention.
Storage	P403+P235 Store in a well-ventilated place. Keep cool.
	P405 Store locked up.
Disposal	P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification

none

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3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration

2-methoxyethanol	2-methoxyethanol	109-86-4	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. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

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. Give one or two glasses of water to drink. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Irritation of skin and eyes. Chronic exposure may also cause weakness, sleepiness, headache, gastrointestinal upset, weight loss, change of personality. (USCG, 1999)

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

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Ethylene glycol, glycols, and related

compounds/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, powder, alcohol-resistant foam, carbon dioxide.

5.2 Specific hazards arising from the chemical

Excerpt from ERG Guide 127 [Flammable Liquids (Water-Miscible)]: HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water. (ERG, 2016)

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

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Wash away remainder with plenty of water.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner

or by wet-brushing and place in container for disposal according to local regulations

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

Fireproof. Separated from strong oxidants and food and feedstuffs. Keep in the dark. Cool.Fireproof. Separated from strong oxidants and food and feedstuffs. Keep in the dark. Cool.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

NIOSH recommends that 2-methoxyethanol (2ME) ... be regarded in the workplace as having the potential to cause adverse reproductive effects in male and female workers. These recommendations are based on the results of several recent studies that have demonstrated dose related embryotoxicity and other reproductive effects in several species of animals exposed by different routes of administration. Appropriate controls should be instituted to minimize worker exposure to 2ME. NIOSH suggests that producers, distributors, and users of 2ME give this information to their workers and customers and that trade associations, and unions inform their members.

Recommended Exposure Limit: 10 Hour Time-Weighted Average: 0.1 ppm (0.3 mg/cu m), skin.

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	colorless clear liquid
Colour	Colorless liquid
Odour	Mild agreeable odor
Melting point/ freezing point	-85°C(lit.)
Boiling point or initial boiling point and boiling range	124-125°C(lit.)
Flammability	Class II Combustible Liquid: Fl.P. at or above 37.78°C and below 60°C.Flammable.
Lower and upper explosion limit / flammability limit	2.5%-19.8% (in air)
Flash point	40°C
Auto-ignition temperature	286.67°C

Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	In water:SOLUBLE
Partition coefficient n-octanol/water (log value)	no data available
Vapour pressure	6.17 mm Hg (20 °C)
Density and/or relative density	0.965g/mLat 25°C(lit.)
Relative vapour density	2.62 (vs air)
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Heat /contributes to instability/

10.3 Possibility of hazardous reactions

FlammableETHYLENE GLYCOL MONOMETHYL ETHER is incompatible with oxygen and strong oxidizing agents. Contact with bases may result in decomposition. Incompatible with acid chlorides and acid anhydrides. . It forms explosive peroxides.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Ethylene glycol monomethyl ether /in air/ forms peroxides that are highly explosive.

10.6 Hazardous decomposition products

Thermal decomposition 204 - 232°C

11. Toxicological information

Acute toxicity

- Oral: LD50 Rabbit oral 890 mg/kg
- 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; Species: Lepomis macrochirus (bluegill); Conditions: /Static bioassay in fresh water at 23°C, mild aeration applied after 24 hr/;

Concentration: >10,000 ppm for 96 hr

- Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (a cladoceran freshwater water flea); Concentration: >1000 mg/L for 24 hr /Conditions of bioassay not specified in source examined
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: Biodegradation of 2-methoxyethanol (100-1000 mg/L) with activated sludge at 20 degrees C for 10 days resulted in 64.7% theoretical BOD(1). Biodegradation of 2-methoxyethanol at 3, 7, and 10 mg/L with filtered sewage seed in fresh water resulted in 30% theoretical BOD in 5 days and 88% theoretical BOD in 20 days; in salt water 6% theoretical BOD in 5 days and 39% theoretical BOD in 20 days was observed(2). Sewage seed degraded 2-methoxyethanol over 5 days resulting in 7% theoretical BOD using unadapted seed and 30% theoretical BOD using adapted seed(3). 2-Methoxyethanol, present at 100 mg/L, reached 83-94% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L in the Japanese Ministry of Trade and Industry (MITI) test(4).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for 2-methyoxyethanol(SRC), using a log Kow of -0.77(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 2-methoxyethanol is estimated as 1(SRC), using a log Kow of -0.77(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that 2-methoxyethanol is expected to have very high mobility in soil(SRC).

12.5 Other adverse effects

no data available

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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: UN1188 IMDG: UN1188 IATA: UN1188

14.2 UN Proper Shipping Name

ADR/RID: ETHYLENE GLYCOL MONOMETHYL ETHER
IMDG: ETHYLENE GLYCOL MONOMETHYL ETHER
IATA: ETHYLENE GLYCOL MONOMETHYL ETHER

14.3 Transport hazard class(es)

ADR/RID: 3 IMDG: 3 IATA: 3

14.4 Packing group, if applicable

ADR/RID: III IMDG: III IATA: III

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
2-methoxyethanol	2-methoxyethanol	109-86-4	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			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.

16. Other information

Information on revision

Creation Date	Aug 10, 2017
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Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%

- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/
