



SAFETY DATA SHEET

DMDEE - 2,2'-Dimorpholinodiethylether

Page: 1/11

Revision date : Jan 10, 2024
Version: 5.0

1. Identification

Product identifier used on the label

DMDEE - 2,2'-Dimorpholinodiethylether

Recommended use of the chemical and restriction on use

Recommended use*: Chemical used in synthesis and/or formulation of industrial products

Recommended use*: initial product for chemical syntheses
for industrial and professional users

Unsuitable for use: Not intended for sale to or use by the general public.

* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

The Hanson Group, LLC
3044 Adriatic Court
Peachtree Corners, GA 30041

Telephone: +1 770-495-9554

Emergency telephone number

24 Hour Emergency Response Information

CHEMTREC: 1-800-424-9300

Other means of identification

Molecular formula: C(12)H(24)N(2)O

CAS-No. 6425-39-4

Synonyms: 2,2-DIMORPHOLINODIETHYLETER PURE
2,2-DIMORPHOLINODIETHYLETER
DMDEE

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024
Version: 5.0

Page: 2/11

Classification of the product

Eye Dam./Irrit. 2B Serious eye damage/eye irritation

Label elements

Signal Word:
Warning

Hazard Statement:
H320 Causes eye irritation.

Precautionary Statements (Prevention):
P264 Wash contaminated body parts thoroughly after handling.

Precautionary Statements (Response):
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical attention.

Hazards not otherwise classified

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

2,2'-dimorpholinyl-diethylether
CAS Number: 6425-39-4
Content (W/W): >= 99.0 - <= 99.8%
Synonym: Morpholine, 4, 4'-(oxydi-2,1-ethanediyl)bis-

4. First-Aid Measures

Description of first aid measures

General advice:
Remove contaminated clothing.

If inhaled:
Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

If on skin:
Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

If in eyes:
Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. Seek medical attention.

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024
Version: 5.0

Page: 3/11

If swallowed:

Rinse mouth and then drink 200-300 ml of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.

Most important symptoms and effects, both acute and delayed

Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11., Further symptoms are possible

Information on: 2,2'-dimorpholinodiethylether

Symptoms: Overexposure may cause: Eye irritation, skin irritation, erythema, nausea, headache, vomiting, dizziness, diarrhea, abdominal cramps

Hazards: No applicable information available.

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
water spray, dry powder, foam, carbon dioxide

Special hazards arising from the substance or mixture

Hazards during fire-fighting:

nitrogen oxides, carbon oxides

The substances/groups of substances mentioned can be released in case of fire. Under certain conditions in case of fire other hazardous combustion products may be generated.

Advice for fire-fighters

Protective equipment for fire-fighting:

Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with the skin, eyes and clothing. Information regarding personal protective measures, see section 8.

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024
Version: 5.0

Page: 4/11

Wear appropriate respiratory protection. Use personal protective clothing. Ensure adequate ventilation.

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

This product is not regulated by RCRA. This product is not regulated by CERCLA ("Superfund").

Methods and material for containment and cleaning up

Spills should be contained, solidified, and placed in suitable containers for disposal.

7. Handling and Storage

Precautions for safe handling

Ensure thorough ventilation of stores and work areas. Handle in accordance with good industrial hygiene and safety practice. When using do not eat, drink or smoke. Hands and/or face should be washed before breaks and at the end of the shift.

Protection against fire and explosion:

Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy.

Conditions for safe storage, including any incompatibilities

Segregate from acids and acid forming substances.

Suitable materials for containers: Low density polyethylene (LDPE), Stainless steel 1.4301 (V2), Stainless steel 1.4401, High density polyethylene (HDPE)

Unsuitable materials for containers: Paper/Fibreboard, Copper, brass

Further information on storage conditions: Keep container tightly closed and dry; store in a cool place. Avoid extreme heat. Keep away from sources of ignition - No smoking.

Storage stability:

Storage duration: 24 Months

From the data on storage duration in this safety data sheet no agreed statement regarding the warrantee of application properties can be deduced.

8. Exposure Controls/Personal Protection

No substance specific occupational exposure limits known.

Advice on system design:

Provide local exhaust ventilation to control vapours/mists.

Personal protective equipment

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A)

Do not exceed the maximum use concentration for the respirator facepiece/cartridge combination. For emergency or non-routine, high exposure situations, use a NIOSH-certified full facepiece

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024

Page: 5/11

Version: 5.0

pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions. Wear a NIOSH-certified (or equivalent) organic vapour respirator.

Hand protection:
Chemical resistant protective gloves

Eye protection:
Wear face shield if splashing hazard exists. Tightly fitting safety goggles (chemical goggles).

Body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures:
No special measures necessary if stored and handled correctly. Wear protective clothing as necessary to prevent contact. Take off immediately all contaminated clothing. Store work clothing separately.

9. Physical and Chemical Properties

Form:	liquid	
Odour:	amine-like	
Odour threshold:	not determined	
Colour:	colourless to yellowish	
pH value:	10.4 (100 g/l, 20 °C)	
Melting point:	-28 °C	
Freezing point:	No data available.	
Boiling point:	> 320 °C (760 mmHg)	
Sublimation point:	No applicable information available.	
Flash point:	146 °C	(closed cup)
Flammability:	hardly combustible	(derived from flash point)
Lower explosion limit:	0.6 %(V) For liquids not relevant for classification and labelling. The lower explosion point may be 5 - 15 °C below the flash point.	
Upper explosion limit:	3.3 %(V) For liquids not relevant for classification and labelling.	
Autoignition:	210 °C Literature data.	
SADT:	Not a substance liable to self-decomposition according to UN transport regulations, class 4.1.	
Vapour pressure:	0.66 hPa (20 °C)	(Regulation 440/2008/EC, A.4)
Density:	1.0603 g/cm ³ (20 °C)	
Relative density:	1.06	
Vapour density:	not determined	

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024
Version: 5.0

Page: 6/11

Partitioning coefficient n-octanol/water (log Pow):	0.5 (25 °C)	(OECD Guideline 117)
Self-ignition temperature:	not self-igniting	
Thermal decomposition:	150 °C, > 100 kJ/kg Thermal decomposition above the indicated temperature is possible. If product is heated above decomposition temperature toxic vapours may be released. No decomposition if used as directed. 350 °C, > 660 kJ/kg Exothermic decomposition.	
Viscosity, dynamic:	29 mPa.s (20 °C)	
Viscosity, kinematic:	216.6 mm ² /s (20 °C)	(measured)
Particle size:	The substance / product is marketed or used in a non solid or granular form.	
Solubility in water:	(20 °C) miscible	
Solubility (quantitative):	No applicable information available.	
Solubility (qualitative):	No applicable information available.	
Molar mass:	244.33 g/mol	
Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.	

10. Stability and Reactivity

Reactivity

Corrosion to metals:
No corrosive effect on metal.

Oxidizing properties:
not fire-propagating

Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.
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Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

Strong exothermic reaction with acids. Reacts with oxidizing agents. Violent reactions.

Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame.

Incompatible materials

mineral acids, isocyanates

Hazardous decomposition products

Decomposition products:

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024
Version: 5.0

Page: 7/11

Hazardous decomposition products: carbon monoxide, carbon dioxide, nitrogen oxides

Thermal decomposition:

150 °C

Thermal decomposition above the indicated temperature is possible. If product is heated above decomposition temperature toxic vapours may be released. No decomposition if used as directed.

350 °C

Exothermic decomposition.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Of low toxicity after single ingestion. Of low toxicity after short-term skin contact.

Oral

Type of value: LD50

Species: rat (male/female)

Value: 2,035 mg/kg (OECD Guideline 401)

Inhalation

No applicable information available.

Dermal

Type of value: LD50

Species: rabbit (male/female)

Value: 3,038 mg/kg (similar to OECD guideline 402)

Assessment other acute effects

Assessment of STOT single:

Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

Irritation / corrosion

Assessment of irritating effects: Eye contact causes irritation. Skin contact causes slight irritation.

Skin

Species: rabbit

Result: non-irritant

Method: OECD Guideline 404

Eye

Species: rabbit

Result: Irritant.

Method: OECD Guideline 405

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024

Page: 8/11

Version: 5.0

Sensitization

Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

Buehler test

Species: guinea pig

Result: Non-sensitizing.

Method: OECD Guideline 406

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: After repeated exposure the prominent effect is local irritation. The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition.

Genetic toxicity

Assessment of mutagenicity: Results from a number of mutagenicity studies with microorganisms, mammalian cell culture and mammals are available. Taking into account all of the information, there is no indication that the substance is mutagenic.

Carcinogenicity

Assessment of carcinogenicity: In long-term animal studies in which the substance was given by inhalation in high concentrations, a carcinogenic effect was not observed. The product has not been tested. The statement has been derived from the structure of the product.

Reproductive toxicity

Assessment of reproduction toxicity: The results of animal studies gave no indication of a fertility impairing effect. The results were determined in a Screening test (OECD 421/422).

Teratogenicity

Assessment of teratogenicity: No indications of a developmental toxic / teratogenic effect were seen in animal studies. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Medical conditions aggravated by overexposure

Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product. See SDS section 11 - Toxicological information.

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish

LC50 (96 h) > 2,150 mg/l, Brachydanio rerio (OECD Guideline 203, static)

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024

Page: 9/11

Version: 5.0

The details of the toxic effect relate to the nominal concentration.

Aquatic invertebrates

EC50 (48 h) > 100 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

The details of the toxic effect relate to the nominal concentration. Limit concentration test only (LIMIT test).

Aquatic plants

EC50 (72 h) > 100 mg/l (growth rate), Pseudokirchneriella subcapitata (OECD Guideline 201, static)

The details of the toxic effect relate to the nominal concentration. Limit concentration test only (LIMIT test).

No observed effect concentration (72 h) 100 mg/l (growth rate), Pseudokirchneriella subcapitata (OECD Guideline 201, static)

The details of the toxic effect relate to the nominal concentration. Limit concentration test only (LIMIT test).

Chronic toxicity to fish

Study not necessary due to exposure considerations.

Chronic toxicity to aquatic invertebrates

Study not necessary due to exposure considerations.

Assessment of terrestrial toxicity

No data available.

Study not necessary due to exposure considerations.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms

OECD Guideline 209 aerobic

activated sludge of a predominantly domestic sewage/EC50 (3 h): > 1,000 mg/l

The details of the toxic effect relate to the nominal concentration.

Persistence and degradability

Assessment biodegradation and elimination (H₂O)

Not readily biodegradable (by OECD criteria). Poorly biodegradable.

Elimination information

< 10 % BOD of the ThOD (28 d) (OECD 301C; ISO 9408; 92/69/EEC, C.4-F) (aerobic, Inoculum conforming to MITI requirements (OECD 301C))

< 10 % DOC reduction (28 d) (OECD 301 A (new version)) (aerobic, activated sludge, domestic, non-adapted)

Assessment of stability in water

In contact with water the substance will hydrolyse slowly.

Information on Stability in Water (Hydrolysis)

t_{1/2} > 1 a, 0 % (5 d) (25 °C, pH value 7), (Directive 92/69/EEC, C.7, pH 7)

Bioaccumulative potential

Assessment bioaccumulation potential

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024

Page: 10/11

Version: 5.0

Does not significantly accumulate in organisms.

Bioaccumulation potential

Bioconcentration factor: 2.9 - 3.1 (56 d), *Cyprinus carpio* (OECD Guideline 305 C)

Mobility in soil

Assessment transport between environmental compartments

The substance will not evaporate into the atmosphere from the water surface.

Adsorption to solid soil phase is not expected.

Additional information

Other ecotoxicological advice:

Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants.

The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

13. Disposal considerations

Waste disposal of substance:

Dispose of in accordance with local authority regulations.

Container disposal:

Dispose of in a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

14. Transport Information

Land transport

USDOT

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Not classified as a dangerous good under transport regulations

Air transport

IATA/ICAO

Not classified as a dangerous good under transport regulations

15. Regulatory Information

Federal Regulations

Registration status:

Chemical TSCA, US released / listed

SDS

DMDEE - 2,2'-Dimorpholinodiethylether

Revision date : Jan 10, 2024
Version: 5.0

Page: 11/11

EPCRA 311/312 (Hazard categories): Refer to SDS section 2 for GHS hazard classes applicable for this product.

NFPA Hazard codes:

Health: 2 Fire: 1 Reactivity: 0 Special:

Assessment of the hazard classes according to UN GHS criteria (most recent version):

Acute Tox.	5 (oral)	Acute toxicity
Acute Tox.	5 (dermal)	Acute toxicity
Skin Corr./Irrit.	3	Skin corrosion/irritation
Eye Dam./Irrit.	2B	Serious eye damage/eye irritation

16. Other Information

Date written: May 17, 2017

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DISCLAIMER: This SDS to the best of our knowledge conforms to the requirements of OSHA 29 CFR 1910.1200, 91/155/EEC and summarizes the health and safety hazard information and general guidance on how to safely handle the material at the date of issue. Each user must review the SDS in the context of how the product will be handled and used in the workplace. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact The Hanson Group, LLC. Responsibility for the product sold is subject to our standard terms and conditions, a copy of which is available upon request. The Hanson Group, LLC warrants only that its products meet the specifications stated in the sales contract. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications. While all the information presented in this document is believed to be reliable and to represent the best available data on these products, NO GUARANTEE, WARRANTY, OR REPRESENTATION IS MADE, INTENDED, OR IMPLIED AS TO THE CORRECTNESS, OR SUFFICIENCY OF ANY INFORMATION, OR AS TO THE MERCHANTABILITY OR SUITABILITY OR FITNESS OF ANY CHEMICAL COMPOUNDS OR OTHER PRODUCTS FOR ANY PARTICULAR USE OR PURPOSE, OR THAT ANY CHEMICAL COMPOUNDS OR OTHER PRODUCTS OR THE USE THEREOF ARE NOT SUBJECT TO A CLAIM BY A THIRD PARTY FOR INFRINGEMENT OF ANY PATENT OR OTHER INTELLECTUAL PROPERTY RIGHT. Some of the information presented and conclusions drawn herein are from sources other than direct test data on the product itself. Liability by The Hanson Group, LLC for all claims, whether arising out of breach of warranty, negligence, strict liability, or otherwise, is limited to the purchase price of the material. Products may be toxic and require special precautions in handling. For all products listed, the user should obtain detailed information on toxicity, together with the proper shipping, handling, and storage procedures, and comply with all applicable safety and environmental standards. Toxicity and risk characteristics of chemical compounds and other products may differ when used with other materials or in a manufacturing or other process. Those risk characteristics should be determined by the user and made known to handlers, processors, and end users.