

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.2
Creation Date: July 15, 2019
Revision Date: August 08, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name Diethanolamine

1.2 Other means of identification

Product number CCEM500789

Other names DEA; 2,2'-Azanediyl diethanol; Ethanol, 2,2'-iminobis-

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.

Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.

Address 3/F, Building B, No. 179 BASIGO, Guangpu Rd East, Huangpu Dist, Guangzhou

Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175

Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Category 4, Oral

Skin irritation, Category 2

Serious eye damage, Category 1

Specific target organ toxicity – repeated exposure, Category 2

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H302 Harmful if swallowed

H315 Causes skin irritation

H318 Causes serious eye damage

H373 May cause damage to organs through prolonged or repeated exposure

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.

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

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

Response

P301+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.

P302+P352 IF ON SKIN: Wash with plenty of water/...

P321 Specific treatment (see ... on this label).

P332+P317 If skin irritation occurs: Get medical help.

P362+P364 Take off contaminated clothing and wash it before reuse.

P305+P354+P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P317 Get medical help.

P319 Get medical help if you feel unwell.

Storage none
Disposal P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Diethanolamine	2,2'-iminodiethanol	111-42-2	203-868-0	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

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

Following eye contact

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

Following ingestion

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

4.2 Most important symptoms/effects, acute and delayed

Irritation of eyes and skin. Breathing vapors may cause coughing, a smothering sensation, nausea, headache. (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 if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on the 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. /Organic bases/Amines and related compounds/

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Wear self contained breathing apparatus for fire fighting if necessary.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Irritating vapors are generated when heated. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use water spray, powder, foam, carbon dioxide.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Sweep spilled substance into covered sealable containers. If appropriate, moisten first to prevent dusting. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Sweep spilled substance into covered sealable containers. If appropriate, moisten first to prevent dusting. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid

formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong oxidants and acids. Dry. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Air sensitive.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 1 mg/m³, as TWA; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans). MAK: (inhalable fraction): 1 mg/m³; peak limitation category: I(1); skin absorption (H); sensitization of skin (SH); carcinogen category: 3B; pregnancy risk group: C

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

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

Eye/face protection

Wear safety goggles or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Solid. Crystals (prisms) or syrupy liquid (above 82 degrees F).
Colour	Colorless.
Odour	Mild, ammonia-like odor
Melting point/freezing point	27 °C. Atm. press.:1 013 hPa.
Boiling point or initial boiling point and boiling range	269.9 °C. Atm. press.:1 013.25 hPa. Remarks:At and above 200 °C, decomposition can clearly be observed.
Flammability	Class IIIB Combustible Liquid: Fl.P. at or above 200°F. Combustible Solid
Lower and upper explosion limit/flammability limit	Lower flammable limit: 1.6% by volume (calculated); Upper flammable limit: 9.8% by volume (estimated)
Flash point	176 °C. Atm. press.:1 013 hPa.
Auto-ignition temperature	375 °C. Atm. press.:1 013 hPa.
Decomposition temperature	no data available
pH	Strong base. pH of 0.1 N aqueous solution: 11.0
Kinematic viscosity	dynamic viscosity (in mPa s) = 390.9. Temperature:30.0°C. Remarks:Calculated based on static viscosity.;dynamic viscosity (in mPa s) = 102.7. Temperature:50.0°C.
Solubility	Miscible with water
Partition coefficient n-octanol/water	log Pow = -2.46. Temperature:25 °C.
Vapour pressure	1 hPa. Temperature:108 °C. Remarks:Measured.;0 hPa. Temperature:20 °C. Remarks:Calculated by regression (Antoine equation).;0 hPa. Temperature:25 °C. Remarks:Calculated by regression (Antoine equation).
Density and/or relative density	1 095.3 kg/m ³ . Temperature:23.8 °C.
Relative vapour density	3.6 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on burning. This produces toxic fumes. The solution in water is a medium strong base. Reacts violently with strong oxidants and strong acids. Attacks copper, zinc, aluminium and their alloys.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

Combustible, when exposed to heat or flame; can react with oxidizing materials. The vapour is heavier than air. DIETHANOLAMINE is an aminoalcohol. Amines are chemical bases. They neutralize acids to form salts plus water. These acid-base reactions are exothermic. The amount of heat that is evolved per mole of amine in a neutralization is largely independent of the strength of the amine as a base. Amines may be incompatible with isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides. Flammable gaseous hydrogen is generated by amines in combination with strong reducing agents, such as hydrides. This compound is hygroscopic. It may be sensitive to exposure to air and light. This compound can react with oxidizing materials, acids, CO₂, copper alloys, aluminum, zinc, galvanized iron and copper. (NTP, 1992)

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

DEA (Diethanolamine) degrades in the presence of carbon dioxide to yield HEOD [3-(2-hydroxy-ethyl)oxazolidone], THEED [N,N,N'-(2-hydroxyethyl)ethyleen-diamine] and BHEP [N,N'-bis(2-hydroxyethyl)piperazine].

10.6 Hazardous decomposition products

Special hazards arising from the substance or mixture: Carbon oxides, nitrogen oxides (NO_x). Nature of decomposition products not known.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD₅₀ - rat (male) - ca. 1 100 mg/kg bw.
- Inhalation: LC₀ - rat (male/female) - 0.2 mg/L air.
- 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

Evaluation: Cancer in humans: There is inadequate evidence in humans for the carcinogenicity of diethanolamine. Cancer in experimental animals: There is sufficient evidence in experimental animals for the carcinogenicity of diethanolamine. Overall evaluation: Diethanolamine is possibly carcinogen to humans (Group 2B).

Reproductive toxicity

No information is available on the reproductive or developmental effects of diethanolamine in humans. Animal studies have reported testicular degeneration and reduced sperm motility and count from oral exposure to diethanolamine. (10)

STOT-single exposure

The substance is corrosive to the eyes.

STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the liver and kidneys.

Aspiration hazard

A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20°C.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC₅₀ - *Oncorhynchus mykiss* (previous name: *Salmo gairdneri*) - 460 mg/L - 96 h. Remarks: Analytically verified.
- Toxicity to daphnia and other aquatic invertebrates: EC₅₀ - *Ceriodaphnia dubia* - 30.1 mg/L - 48 h.
- Toxicity to algae: EC₅₀ - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 9.5 mg/L - 72 h.
- Toxicity to microorganisms: EC₁₀ - activated sludge, domestic - > 1 000 mg/L - 30 min. Remarks: Respiration rate.

12.2 Persistence and degradability

AEROBIC: Biodegradation of diethanolamine has been reported in many die-away tests(1-3). N-Nitrosodiethanolamine has been identified as a metabolite of diethanolamine in natural water samples and sewage(2). Media Initial Conc'n Incubation Time (days) % Biodegradation Reference River Water 21 mg/L 4 5 1 River Water 210 ug/L 4 5 5 1 River Water 21 ng/L 4 32 1 Lake Water 1.1 ppm 14 31 2 Acidic Lake Water 1.1 ppm 14 1.2 2 Sewage 1.1 ppm 14 53 2 River Water 50 ppm 10 90 3

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for diethanolamine(SRC), using a log Kow of -1.43(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 diethanolamine has been reported as 3.97(1) and an experimental log Koc of 0.60(2). According to a classification scheme(3), these Koc values suggest that diethanolamine is expected to have very high mobility in soil. The pKa of diethanolamine is 8.96(4), indicating that this compound will exist partially in cation form in the environment and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(5). Diethanolamine has been shown to adsorb to humic acid which may be contained in soils and sediments(6). The adsorption of diethanolamine on humic acid changed very slightly from pH 4-8, (40-45% adsorption)(6).

12.5 Other adverse effects

no data available

SECTION 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.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

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 IMO instruments

no data available

SECTION 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
2,2'-iminodiethanol	2,2'-iminodiethanol	111-42-2	203-868-0
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.
Korea Existing Chemicals List (KECL)	Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019
Revision Date August 08, 2025

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/>

Other Information

Do NOT take working clothes home.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

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