

SAFETY DATA SHEET

Version 5.10
Revision Date 06/23/2016
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1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Diethanolamine

Product Number : D8885
Brand : Sigma-Aldrich
Index-No. : 603-071-00-1

CAS-No. : 111-42-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 4), H302
Skin irritation (Category 2), H315
Serious eye damage (Category 1), H318
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure (Category 2), H373
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word : Danger

Hazard statement(s)

H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Bis(2-hydroxyethyl)amine
2,2'-Iminodiethanol

Formula : C₄H₁₁NO₂
Molecular weight : 105.14 g/mol
CAS-No. : 111-42-2
EC-No. : 203-868-0
Index-No. : 603-071-00-1

Hazardous components

Component	Classification	Concentration
Diethanolamine		
	Acute Tox. 4; Skin Irrit. 2; Eye Dam. 1; Carc. 2; STOT RE 2; Aquatic Acute 3; Aquatic Chronic 3; H302, H315, H318, H351, H373, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 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.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

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.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Diethanolamine	111-42-2	TWA	1 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Liver damage Kidney damage Confirmed animal carcinogen with unknown relevance to humans		

		Danger of cutaneous absorption		
		TWA	1.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Liver damage Kidney damage Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	3.000000 ppm 15.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	0.46 ppm 2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls

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

Personal protective equipment

Eye/face protection

Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

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.

Full contact

Material: Nature latex/chloroprene

Minimum layer thickness: 0.6 mm

Break through time: 480 min

Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 30 min

Material tested: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance	Form: viscous liquid Colour: colourless
b) Odour	ammoniacal
c) Odour Threshold	No data available
d) pH	11.0 - 12 at 105 g/l at 25 °C (77 °F)
e) Melting point/freezing point	Melting point/range: 28 °C (82 °F)
f) Initial boiling point and boiling range	217 °C (423 °F) at 200 hPa (150 mmHg)
g) Flash point	138 °C (280 °F) - closed cup
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	Upper explosion limit: 10.6 %(V) Lower explosion limit: 1.6 %(V)
k) Vapour pressure	1 hPa (1 mmHg) at 108 °C (226 °F)
l) Vapour density	3.63 - (Air = 1.0)
m) Relative density	1.097 g/mL at 25 °C (77 °F)
n) Water solubility	105 g/l at 20 °C (68 °F) - completely soluble
o) Partition coefficient: n-octanol/water	log Pow: -2.18
p) Auto-ignition temperature	355 °C (671 °F) at 1,013 hPa (760 mmHg)
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

Dissociation constant	8.92 at 23 °C (73 °F)
Relative vapour density	3.63 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Absorbs carbon dioxide (CO₂) from air.
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Oxidizing agents, Copper, Zinc, Iron

10.6 Hazardous decomposition products

Other decomposition products - No data available

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides (NOx)

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - 1,600 mg/kg
(OECD Test Guideline 401)

Inhalation: No data available

LD50 Dermal - Rabbit - 12,200 mg/kg

LD50 Intraperitoneal - Rat - 120 mg/kg

LD50 Intravenous - Rat - 778 mg/kg

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Risk of serious damage to eyes.
(OECD Test Guideline 405)

Respiratory or skin sensitisation

Maximisation Test - Guinea pig

Did not cause sensitisation on laboratory animals.
(OECD Test Guideline 406)

Germ cell mutagenicity

Micronucleus test

lymphocyte

Result: negative

Mutagenicity (micronucleus test)

Mouse - male and female

Result: negative

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Diethanolamine)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

Kidney, Liver, Blood

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

Repeated dose toxicity Rat - male and female - Oral - LOAEL : 25 mg/kg - OECD Test Guideline 408

RTECS: KL2975000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Liver - Irregularities - Based on Human Evidence

Liver - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 1,460 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates static test EC50 - Daphnia magna (Water flea) - 30.1 mg/l - 48 h

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d
Result: 93 % - Readily biodegradable
(OECD Test Guideline 301F)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Diethanolamine)
Reportable Quantity (RQ): 100 lbs

Poison Inhalation Hazard: No

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Diethanolamine	111-42-2	2011-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Diethanolamine	111-42-2	2011-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Diethanolamine	111-42-2	2011-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Diethanolamine	111-42-2	2011-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.

	CAS-No.	Revision Date
Diethanolamine	111-42-2	2012-07-20

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Dam.	Serious eye damage
H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	1
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	1
Reactivity Hazard:	0

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

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