



SIGMA-ALDRICH

Material Safety Data Sheet

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Section 1 - Product and Company Information

Product Name Diethanolamine, SigmaUltra, minimum 98.5%
Product Number D0681
Brand Sigma Chemical

Company Sigma-Aldrich
Street Address 3050 Spruce Street
City, State, Zip, Country SAINT LOUIS, MO 63103 US
Technical Phone: 314 771 5765
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Emergency Phone: 414 273 3850 Ext. 5996

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
DIETHANOLAMINE	111-42-2	Yes	203-868-0	603-071-00-1

Formula C4H11NO2
Synonyms Bis(2-hydroxyethyl)amine, DEA, Diaethanolamin (German), Diethanolamin (Czech), Diethanolamine (ACGIH), Diethylamine, 2,2'-dihydroxy-, Diethylolamine, 2,2'-Dihydroxydiethylamine, Di(2-hydroxyethyl)amine, Diolamine, 2-(2-Hydroxyethylamino)ethanol, 2,2'-Iminobisethanol, 2,2'-Iminodiethanol, NCI-C55174

Section 3 - Hazards Identification

Emergency Overview
Harmful.
Harmful if swallowed. Irritating to skin. Risk of serious damage to eyes. Harmful: danger of serious damage to health by prolonged exposure if swallowed.
Target organ(s): Liver, Kidneys.

HMIS Rating
Health: 2* Flammability: 0 Reactivity: 1

NFPA Rating
Health: 2 Flammability: 0 Reactivity: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

Inhalation Exposure
If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

Dermal Exposure

In case of contact, immediately wash skin with soap and copious amounts of water.

Eye Exposure

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

Flash Point: 280,4 °F 138 °C

Explosion Limits: Lower: 1,6 % Upper: 10,6 %

Autoignition Temp: 365 °C

Extinguishing Media

Suitable

Water spray, Carbon dioxide, dry chemical powder, or appropriate foam.

Firefighting

Protective Equipment

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s)

Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill

Evacuate area.

Procedure(s) of Personal Precaution(s)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling

User Exposure

Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

Storage

Suitable

Keep tightly closed.

Special Requirements

Air sensitive.

Section 8 - Exposure Controls / PPE

Engineering Controls

Safety shower and eye bath. Mechanical exhaust required.

Personal Protective Equipment

Respiratory

Government approved respirator.

Hand

Compatible chemical-resistant gloves.

Eye

Chemical safety goggles.

General Hygiene Measures

Wash thoroughly after handling.

Exposure Limits, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	2 MG/M3
Remarks: Skin			
New Zealand	OEL		
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	3 PPM

Section 9 - Physical/Chemical Properties**Appearance****Physical State**

Liquid

Molecular Weight: 105.14 AMU

Property	Value	At Temperature or Pressure
pH	11.0 - 12.0	
BP/BP Range	217 °C	150 mmHg
MP/MP Range	27 - 31 °C	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	3.6 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.097 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	< 0.2 %	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Partition Coefficient	Log Kow: -2.18	
Decomposition Temp.	N/A	
Flash Point °F	280.4 °F	Method: closed cup
Flash Point °C	138 °C	Method: closed cup
Explosion Limits	Lower: 1.6 % Upper: 10.6 %	
Flammability	N/A	
Autoignition Temp	365 °C	
Refractive Index	1.477	
Solubility	Solubility in Water: 1 M in H2O, 20°C, complete, colorless	

N/A = not available

Section 10 - Stability and Reactivity**Stability**

Stable

Stable

Conditions of Instability

Absorbs carbon dioxide from air.

Materials to Avoid

Oxidizing agents, Copper, Copper alloys, Zinc, Galvanized iron.

Hazardous Decomposition Products**Hazardous Decomposition Products**

Carbon monoxide, Carbon dioxide, Nitrogen oxides.

Hazardous Polymerization**Hazardous Polymerization**

Will not occur.

Section 11 - Toxicological Information**Route of Exposure****Skin Contact**

Causes skin irritation.

Skin Absorption

May be harmful if absorbed through the skin.

Eye Contact

Causes severe eye irritation.

Inhalation

May be harmful if inhaled.

Ingestion

Harmful if swallowed.

Target Organ(s) or System(s)

Liver. Kidneys. Blood.

Signs and Symptoms of Exposure

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

RTECS Number: KL2975000**Toxicity Data**

Oral - Rat: 620 UL/KG (LD50)

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Lacrimation.

Behavioral: Tremor.

Skin and Appendages: Other: Hair.

Intraperitoneal - Rat: 120 MG/KG (LD50)

Subcutaneous - Rat: 2200 MG/KG (LD50)

Intravenous - Rat: 778 MG/KG (LD50)

Intramuscular - Rat: 1500 MG/KG (LD50)

Oral - Mouse: 3300 mg/kg (LD50)

Remarks: Behavioral: Somnolence (general depressed activity).

Behavioral: Excitement.

Behavioral: Muscle contraction or spasticity.

Intraperitoneal - Mouse: 210 MG/KG (LD50)

Oral - Rabbit: 2200 mg/kg (LD50)

Skin - Rabbit: 7640 UL/KG (LD50)

Remarks: Behavioral: Ataxia.

Other changes

Skin and Appendages: Skin: After systemic exposure: Dermatitis, other

Oral - Guinea pig: 2000 mg/kg (LD50)

Skin - Guinea pig: 11900 UL/KG (LD50)

Irritation Data

Skin - Rabbit: 50 mg

Remarks: Open irritation test

Skin - Rabbit: 500 mg 24H
Remarks: Mild irritation effect

Eyes - Rabbit: 5,500 mg
Remarks: Severe irritation effect

Eyes - Rabbit: 0.75 mg 24H
Remarks: Severe irritation effect

Chronic Exposure - Carcinogen

Mouse - Skin: 21 GM/KG 2Y I
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

NTP Carcinogen List

<u>Rating</u>	<u>Species</u>	<u>Route</u>
Clear evidence.	Mouse	Skin
No evidence.	Rat	Skin

Chronic Exposure - Reproductive Hazard

<u>Species</u>	<u>Dose</u>	<u>Route of Application</u>	<u>Exposure Time</u>
Rat	18382 MG/KG	Oral	(14D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).			
Rat	15 GM/KG	Skin	(6-15D PREG)
Result: Maternal Effects: Other effects. Effects on Newborn: Other postnatal measures or effects.			
Rabbit	4550 MG/KG	Skin	(6-18D PREG)
Result: Maternal Effects: Other effects.			

Section 12 - Ecological Information

Acute Ecotoxicity Tests

Test Type	
EC50 Algae	
Time:	Value:
72.0 h	75 mg/l
Test Type	
EC50 Daphnia	
Species	
Daphnia magna	
Time:	Value:
48.0 h	55 mg/l
Test Type	
LC50 Fish	
Species	
Pimephales promelas (Fathead minnow)	
Time:	Value:
96.0 h	1,460 mg/l
Test Type	
LC50 Fish	
Species	
Cyprinus carpio	
Time:	Value:
96.0 h	> 540 mg/l
Test Type	
LC50 Fish	
Species	
Lepomis macrochirus (Bluegill)	
Time:	Value:
96.0 h	> 100 mg/l

Elimination

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation

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.
Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s.
UN#: 3077
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA

Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU Directives Classification

Symbol of Danger: Xn

Indication of Danger

Harmful.

Risk Statements R: 22 38 41 48/22

Harmful if swallowed. Irritating to skin. Risk of serious damage to eyes. Harmful: danger of serious damage to health by prolonged exposure if swallowed.

Safety Statements S: 26 36/37/39 46

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. If swallowed, seek medical advice immediately and show this container or label.

US Classification and Label Text

Indication of Danger

Harmful.

Risk Statements

Harmful if swallowed. Irritating to skin. Risk of serious damage to eyes. Harmful: danger of serious damage to health by prolonged exposure if swallowed.

Safety Statements

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. If swallowed, seek medical advice immediately and show this container or label.

US Statements

Target organ(s): Liver. Kidneys.

United States Regulatory Information

SARA Listed: Yes

Demimis: 1 %

Notes: This product is subject to SARA section 313 reporting requirements.

TSCA Inventory Item: Yes

Canada Regulatory Information

WHMIS Classification

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

Section 16 - Other Information

Disclaimer

For R&D use only. Not for drug, household or other uses.

Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.