

## MATERIAL SAFETY DATA SHEET

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Version 1.6

## Section 1 - Product and Company Information

Product Name	ETHYLENEDIAMINE, REAGENTPLUS, 99%
Product Number	E26266
Brand	SIAL
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
1,2-DIAMINOETHANE	107-15-3	Yes
Formula	C2H8N2	
Synonyms	Aethaldiamin (German) * Aethylenediamin (German) * 1,2-Diaminoethan (German) * 1,2-Diamino-ethaan (Dutch) * 1,2-Diaminoethane (OSHA) * 1,2-Diamino-ethano (Italian) * Dimethylenediamine * Ethyleendiamine (Dutch) * Ethylendiamine * Ethylenediamine * 1,2-Ethylenediamine * Ethylenediamine (ACGIH:OSHA) * Ethylene-diamine (French) * NCI-C60402	
RTECS Number:	KH8575000	

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Corrosive. Flammable.

Harmful in contact with skin and if swallowed. Causes burns. May cause sensitization by inhalation and skin contact.

Lachrymator. Readily absorbed through skin. Target organ(s):  
Kidneys. Liver.

## HMIS RATING

HEALTH: 3\*

FLAMMABILITY: 3

REACTIVITY: 1

## NFPA RATING

HEALTH: 3

FLAMMABILITY: 3

REACTIVITY: 1

\*additional chronic hazards present.

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

## Section 4 - First Aid Measures

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#### ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately. Do not induce vomiting.

#### INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

#### DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

#### 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.

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### Section 5 - Fire Fighting Measures

#### FLAMMABLE HAZARDS

Flammable Hazards: Yes

#### EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions. Forms explosive mixtures in air.

#### FLASH POINT

100.4 °F    38 °C    Method: closed cup

#### EXPLOSION LIMITS

Lower: 2.7 %    Upper: 16 %

#### AUTOIGNITION TEMP

379 °C

#### FLAMMABILITY

N/A

#### EXTINGUISHING MEDIA

Suitable: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

#### FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

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### Section 6 - Accidental Release Measures

#### PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

#### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

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

#### METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

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### Section 7 - Handling and Storage

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#### HANDLING

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

#### STORAGE

Suitable: Keep tightly closed. Keep away from heat, sparks, and open flame.

#### SPECIAL REQUIREMENTS

Air and moisture sensitive. Handle and store under inert gas.

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### Section 8 - Exposure Controls / PPE

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#### ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Use only in a chemical fume hood.

#### PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). 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.  
Hand: Compatible chemical-resistant gloves.  
Eye: Chemical safety goggles.  
Other: Faceshield (8-inch minimum).

#### GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

#### EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	TWA	10 PPM
Remarks: Skin			
USA	MSHA Standard-air	TWA	10 PPM (25 MG/M3)
USA	OSHA.	PEL	8H TWA 10 PPM (25 MG/M3)
New Zealand OEL			
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	10 PPM

#### EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	20 MG/M3
Poland		NDSch	50 MG/M3
Poland		NDSP	-

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### Section 9 - Physical/Chemical Properties

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Appearance	Physical State: Liquid	
Property	Value	At Temperature or Pressure
Molecular Weight	60.1 AMU	
pH	12.2	20 °C Concentration: 110 g/l
BP/BP Range	117.0 - 118.0 °C	
MP/MP Range	10 °C	
Freezing Point	N/A	
Vapor Pressure	10 mmHg	20 °C
Vapor Density	2.07 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.897 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	< 0.5 %	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	0.002 Pas	20 °C
Surface Tension	N/A	
Partition Coefficient	Log Kow: - 2.040	
Decomposition Temp.	N/A	
Flash Point	100.4 °F 38 °C	Method: closed cup
Explosion Limits	Lower: 2.7 % Upper: 16 %	
Flammability	N/A	
Autoignition Temp	379 °C	
Refractive Index	1.456	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water: Soluble. Other Solvents: BENZENE SLIGHTLY IN ETHER	

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Conditions of Instability: Absorbs carbon dioxide from air.

Conditions to Avoid: Air. Moisture.

Materials to Avoid: Oxidizing agents, Phosphorus halides, Aldehydes, Organic halides.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Amines, Ammonia, Nitrogen oxides.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: Causes burns.

Skin Absorption: Readily absorbed through skin. Harmful if absorbed through skin.

Eye Contact: Lachrymator. Causes burns.

Inhalation: May be harmful if inhaled. Material is extremely

destructive to the tissue of the mucous membranes and upper respiratory tract.

Ingestion: Harmful if swallowed.

#### SENSITIZATION

Respiratory: May cause allergic respiratory reaction.

Skin: May cause allergic skin reaction.

#### TARGET ORGAN(S) OR SYSTEM(S)

Kidneys. Liver. Blood. Lungs.

#### SIGNS AND SYMPTOMS OF EXPOSURE

Exposure can cause: Repeated exposure may cause asthma. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Stomach pains, vomiting, diarrhea.

#### TOXICITY DATA

Oral

Rat

1200 mg/kg

LD50

Remarks: Behavioral:Ataxia.

Intraperitoneal

Rat

76 MG/KG

LD50

Subcutaneous

Rat

300 MG/KG

LD50

Oral

Mouse

1000 mg/kg

LD50

Remarks: Behavioral:Ataxia.

Inhalation

Mouse

300 mg/m<sup>3</sup>

LC50

Intraperitoneal

Mouse

200 MG/KG

LD50

Skin

Rabbit

730 UL/KG

LD50

Oral

Guinea pig

470 mg/kg

LD50

Remarks: Behavioral:Somnolence (general depressed activity).  
Gastrointestinal:Other changes. Kidney, Ureter, Bladder:Other  
changes.

#### IRRITATION DATA

Skin

Rabbit

Remarks: Severe irritation effect

Skin

Rabbit

450 mg

Remarks: Open irritation test

Skin

Rabbit

10 mg

24H

Remarks: Open irritation test

Eyes

Rabbit

0.75 mg

Remarks: Severe irritation effect

Eyes

Rabbit

0.75 mg

24H

Remarks: Severe irritation effect

#### CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not  
classifiable as to its carcinogenicity based on its IARC, ACGIH,  
NTP, or EPA classification.

#### ACGIH CARCINOGEN LIST

Rating: A4

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Mouse

Dose: 3200 MG/KG

Route of Application: Oral

Exposure Time: (6-13D PREG)

Result: Effects on Newborn: Growth statistics (e.g., reduced  
weight gain).

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#### Section 12 - Ecological Information

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#### ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae

Species: Selenastrum capricornutum resp.

Time: 96 h

Value: 151 mg/l

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h  
Value: 20.4 - 46.0 mg/l

Test Type: LC50 Fish  
Species: Leuciscus idus  
Time: 48 h  
Value: 405 mg/l

Test Type: LC50 Fish  
Species: Pimephales promelas (Fathead minnow)  
Time: 96 h  
Value: 115.7 mg/l

#### ADDITIONAL RESULTS/DATA FROM RELEVANT SCIENTIFIC EXPERIMENTS

Avoid contamination of the environment

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#### Section 13 - Disposal Considerations

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##### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

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#### Section 14 - Transport Information

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##### DOT

Proper Shipping Name: Ethylenediamine  
UN#: 1604  
Class: 8  
Packing Group: Packing Group II  
Hazard Label: Corrosive  
Hazard Label: Flammable liquid  
PIH: Not PIH

##### IATA

Proper Shipping Name: Ethylenediamine  
IATA UN Number: 1604  
Hazard Class: 8  
Packing Group: II

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#### Section 15 - Regulatory Information

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##### EU DIRECTIVES CLASSIFICATION

Symbol of Danger: C  
Indication of Danger: Corrosive.  
R: 10-21/22-34-42/43  
Risk Statements: Flammable. Harmful in contact with skin and if swallowed. Causes burns. May cause sensitization by inhalation and skin contact.  
S: 23-26-36/37/39-45  
Safety Statements: Do not breathe vapor. 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. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

##### US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Corrosive. Flammable.  
Risk Statements: Harmful in contact with skin and if swallowed.

Causes burns. May cause sensitization by inhalation and skin contact.

Safety Statements: Keep away from sources of ignition - no smoking. Do not breathe vapor. 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. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US Statements: Lachrymator. Readily absorbed through skin.

Target organ(s): Kidneys. Liver.

#### UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

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

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#### Section 16 - Other Information

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#### 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 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.