

SAFETY DATA SHEET



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ETHYLENEDIAMINE ANHYDROUS

SDS No. M0096

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Ethylenediamine Anhydrous

Synonyms: 1,2-Ethanediamine; 1,2-Diaminoethane

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION



Classification:

Flammable Liquids: GHS Category 3

Acute Toxicity, Oral: GHS Category 4

Acute Toxicity, Inhalation: GHS Category 4

Acute Toxicity, Dermal: GHS Category 3

Skin Corrosion: GHS Category 1B

Serious Eye Damage: GHS Category 1

Respiratory Sensitization: GHS Category 1

Skin Sensitization: GHS Category 1

Acute Aquatic Toxicity: GHS Category 2

Chronic Aquatic Toxicity: GHS Category 3

Label Elements

Signal Word: DANGER!

Hazard Statements:

H226 – Flammable liquid and vapor.

H302 – Harmful if swallowed.

H312 – Harmful in contact with skin.

H314 – Causes severe skin burns and eye damage.

H317 – May cause an allergic skin reaction.

H332 – Harmful if inhaled.

Precautionary Statements:

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Clear focus. Consistent results. Complete confidence.

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

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

P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P342+P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor.

P403+P235 - Store in a well-ventilated place. Keep cool.

P405 - Store locked up.

P501 - Dispose of contents/ container to an approved waste disposal plant.

Emergency Overview

Causes burns by all exposure routes. Harmful if swallowed or absorbed through the skin. May cause liver, kidney, and lung damage. May cause cardiac disturbances. May cause central nervous system effects. May cause allergic skin and respiratory reactions. Lachrymator. Flammable liquid and vapor. Hygroscopic. Target Organs: Kidneys, central nervous system, and liver.

HMIS Rating:

Health – 3* Flammability – 2 Physical Hazard – 0 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Ethylenediamine	107-15-3	>99%	Yes

4. FIRST-AID MEASURES

Inhalation: Get medical aid immediately. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion: Do not induce vomiting. If conscious, give victim 2-4 cups of milk or water. Get medical aid immediately.

Skin Contact: Remove any contaminated clothing. Flush skin with water for at least 15 minutes. Get medical attention if irritation develops or persists. Destroy contaminated shoes.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately. Do not allow victim to rub eyes.

Notes to Physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flammability: Flammable liquid and vapor (GHS Category 3).

Auto-ignition Temperature: 385° C (725° F)

Flash Point: 34° C (93° F)

Flammable Limits: Lower Limit – 2.7 vol %, Upper Limit – 16.6 vol %

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (carbon monoxide, carbon dioxide, nitrogen oxides, ammonia and derivatives).

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire.

Specific Explosion Hazards: Vapors may form an explosive mixture with air. Can release vapors that form explosive mixtures at temperatures above the flashpoint.

Fire Fighting Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use foam, dry chemical, or carbon dioxide.

National Fire Protective Association: Health - 3, Flammability - 2, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Use spark-proof tools. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Use spark-proof tools and explosion proof equipment. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Use only in a chemical fume hood. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Store protected from moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear protective chemical goggles and face shield for eye and face protection. Use butyl rubber gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits:

- ACGIH – 10 ppm TWA, skin – potential for cutaneous absorption
- NIOSH – 10 ppm, 25 mg/m³ TWA, 1000 ppm IDLH
- OSHA Final PELs – 10 ppm, 25 mg/m³ TWA
- OSHA Vacated PELs: 10 ppm, 25 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Ammonia like

Molecular Formula: NH₂(CH₂)₂NH₂

Molecular Weight: 60.10

Auto-ignition Temperature: 385° C (725° F)

Flash Point: 34° C (93° F)

Flammable Limits: Lower Limit – 2.7 vol %, Upper Limit – 16.6 vol %

pH: 11.9 at 25° C

Boiling Point: 118° C @ 760 mm Hg

Freezing/Melting Point: 8.5° C

Decomposition Temperature: >120° C.

Specific Gravity: 0.899 g/cm³

Vapor Density (Air=1):2.1

Vapor Pressure: 10.7 mm Hg @ 20° C.

Evaporation Rate (Butyl acetate = 1): 0.91.

Viscosity: 1.54 cP @ 20° C.

Solubility: Soluble

Conductivity: Conductive; Conductivity = 9×10^6 pS/m; Dielectric Constant = 12.9; Relaxation Time Constant = 1.3×10^{-5} seconds

10. STABILITY AND REACTIVITY

Stability: Absorbs carbon dioxide from air to form nonvolatile carbonate.

Conditions to Avoid: Ignition sources, exposure to air, excess heat, exposure to moist air or water.

Incompatibility With Various Substances: Strong oxidizers, Phosphorous halides, Aldehydes, Organic halides.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, nitrogen oxides, ammonia and derivatives.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Causes respiratory tract irritation. May cause severe allergic respiratory reaction. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause liver and kidney damage. Causes chemical burns to the respiratory tract. May cause heart disturbances, possibly leading to cardiac arrest and death. May cause neurotoxic effects including paresthesia.

INGESTION HAZARD: Harmful if swallowed. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause effects similar to those for inhalation exposure.

SKIN CONTACT HAZARD: Harmful if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Contact with the skin may cause severe irritation and necrosis.

EYE CONTACT HAZARD: Causes eye burns. May result in corneal injury. Causes redness and pain. Lachrymator (substance which increases the flow of tears).

Chronic Exposure Hazards: Prolonged or repeated skin contact may cause defatting and dermatitis. Repeated exposure may cause allergic respiratory reaction (asthma).

Animal Toxicity:

Skin corrosion/irritation, rabbit: causes burns:

Eye Damage/irritation, rabbit: corrosive;

Inhalation, at: LC50 = 14.7 mg/L;

Oral, rat: LD50 = 1200 mg/kg;

Skin, rabbit: LD50 = 560 mg/kg.

Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65

Epidemiology: Edema of the epithelium of the cornea, generally without pain, has been produced by amine vapors, causing colored haloes to be seen around lights, usually in the evening, after industrial exposure to the vapors of various amines.

Teratogenicity: No information available.

Reproductive Effects: Adverse effects have been observed in animals.

Mutagenicity: Not known to be a mutagen.

Neurotoxicity: Substance may cause neurotoxic effects.

Other Studies: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Fish: Fathead Minnow: LC50 = 115.7 mg/L; 96H

Water flea: EC50 = 0.88 mg/L; 48H

Algae: Green: EC50 = 151 mg/L; 96H

Environmental Fate: Readily biodegradable, 94%.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use, or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

US DOT

Proper Shipping Name: Ethylenediamine

Hazard Class: 8 (3)

UN Number: UN1604

Packing Group: II

IMDG

Proper Shipping Name: Ethylenediamine

Hazard Class: 8 (3)

UN Number: UN1604

Packing Group: II

IATA

Proper Shipping Name: Ethylenediamine

Hazard Class: 8 (3)

UN Number: UN1604

Packing Group: II

15. REGULATORY INFORMATION

US Federal Regulations:

CERCLA Hazardous Substances: CAS# 107-15-3: 5000 lb (2270 kg) RQ

SARA Section 302: CAS# 107-15-3: 10,000 lb TPQ

SARA Codes: CAS# 107-15-3 – acute, chronic, flammable

Section 313: Ethylenediamine (107-15-3) is not subject to SARA Title III Section 313 40 CFR 373 reporting requirements.

OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

CAS# 107-15-3 is on the following state right-to-know lists: New Jersey, Pennsylvania, and Massachusetts

California Prop 65: This product contains no materials known to the state of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Originally Prepared: 6/30/2006

Last Revised: 03/22/2021 – Updated precautionary statements.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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