

Chemical Safety Data Sheet MSDS / SDS

Ethylenediamine SDS

Revision Date:2024-04-25 Revision Number:1

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product identifier**

Product name: Ethylenediamine
CAS: 107-15-3

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.
Uses advised against: none

Company Identification

Company: Chemicalbook.in
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SECTION 2: Hazards identification**Classification of the substance or mixture**

Flammable liquids, Category 3
Acute toxicity - Category 4, Oral

Acute toxicity - Category 4, Dermal
Skin corrosion, Sub-category 1B
Skin sensitization, Category 1
Respiratory sensitization, Category 1

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H226 Flammable liquid and vapour
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
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be allowed out of the workplace.
P284 [In case of inadequate ventilation] wear respiratory protection.

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].

P370+P378 In case of fire: Use ... to extinguish.
P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P317 Get medical help.
P321 Specific treatment (see ... on this label).
P362+P364 Take off contaminated clothing and wash it before reuse.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P363 Wash contaminated clothing before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316 Get emergency medical help immediately.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P317 If skin irritation or rash occurs: Get medical help.
P342+P316 If experiencing respiratory symptoms: Get emergency medical help immediately.

Storage

P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

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.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Ethylenediamine
Common names and synonyms:	Ethylenediamine
CAS number:	107-15-3
EC number:	203-468-6

Concentration: 100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

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 . Do NOT induce vomiting.

Most important symptoms/effects, acute and delayed

Vapor inhalations at a concentration of 200 ppm for 5 to 10 minutes will lead to nasal irritation and produce a tingling sensation. Inhalation at concentrations of 400 ppm or greater leads to severe nasal irritation. Respiratory irritation may result. Many individuals are hypersensitive to ethylenediamine exposure; therefore, safe threshold limits are difficult to set. (EPA, 1998)

Indication of immediate medical attention and special treatment needed, if necessary

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 l/min. Monitor for pulmonary edema and treat if necessary . Monitor for shock and treat if necessary . Anticipate seizures and treat if necessary . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport . Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal . Cover skin bumps with dry sterile dressings after decontamination . /Organic bases/amines and related compounds/

SECTION 5: Firefighting measures

Suitable extinguishing media

Use water spray, dry chem, "alcohol resistant" foam, or carbon dioxide. Use water spray to keep fire-exposed containers cool. Solid streams may be ineffective and spread material.

Specific hazards arising from the chemical

Burning rate: 2.2 mm/minute. When exposed to heat or flame, the material has a moderate fire potential. The material can react readily with oxidizing materials. Containers may explode in heat of fire. Material emits nitrogen oxides when burned. Avoid carbon disulfide, silver perchlorate, imines, oxidizing materials. Stable. Hazardous polymerization may not occur. (EPA, 1998)

Special protective actions for fire-fighters

Use water spray, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Remove all ignition sources. Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Collect the spilled substance into containers. The container should be made of the same material as the original container.

Environmental precautions

Remove all ignition sources. Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Ventilation. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

1. Remove all ignition sources. 2. Ventilate area of spill or leak. 3. If in the liq form, absorb on paper towels. Evaporate in a safe place (such as a fume hood). Allow sufficient time for evaporating vapors to completely clear the hood ductwork. Burn the paper in a suitable location away from combustible materials. Large quantities can be collected and atomized in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. ... 4. If in the solid form, collect, allow to melt, and dispose of the liq as above.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Above 34°C use a closed system, ventilation and explosion-proof electrical equipment. 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.

Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants, acids, chlorinated organic compounds and food and feedstuffs. Dry. Outside or detached storage is preferred. Avoid oxidizing materials, acids, and sources of halogens. Store in a cool, dry, well-ventilated location.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 10 ppm as TWA; (skin); A4 (not classifiable as a human carcinogen). MAK sensitization of respiratory tract and skin (SAH)

Biological limit values

no data available

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.

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

Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Ethylenediamine is a clear colorless liquid with an ammonia-like odor. Flash point of 91°F and a melting point of 47°F. Corrosive to tissue. Vapors are heavier than air. Produces toxic oxides of nitrogen during combustion. Density 7.5 lb / gal. Used to make other chemicals and as a fungicide.
Colour:	Water-white liquid
Odour:	Ammonia-like
Melting point/freezing point:	11°C
Boiling point or initial boiling point and boiling range:	118°C(lit.)
Flammability:	Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.
Lower and upper explosion limit/flammability limit:	LOWER 2.5%; UPPER 12% @ 100 DEG C /ANHYDROUS 76%/
Flash point:	38°C
Auto-ignition temperature:	716°F
Decomposition temperature:	no data available
pH:	11.9 @ 25 deg C (25% soln)
Kinematic viscosity:	0.0154 cP @ 25 deg C
Solubility:	greater than or equal to 100 mg/mL at 63° F (NTP, 1992)
Partition coefficient n-octanol/water:	log Kow = -2.04 @ pH 13

Vapour pressure:	10 mm Hg (20 °C)
Density and/or relative density:	0.899g/mL at 25 °C (lit.)
Relative vapour density:	2.07 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on burning. This produces toxic fumes of nitrogen oxides. The substance is a medium strong base. Reacts with chlorinated organic compounds, strong oxidants and acids.

Chemical stability

no data available

Possibility of hazardous reactions

FLAMMABLE LIQUID WHEN EXPOSED TO HEAT, FLAME OR OXIDIZERS. A base. Highly reactive with many compounds. Can react violently with acetic acid, acetic anhydride, acrolein, acrylic acid, acrylonitrile, allyl chloride, carbon disulfide, chlorosulfonic acid, epichlorohydrin, ethylene chlorohydrin, hydrogen chloride, mesityl oxide, nitric acid, oleum, AgClO₄, sulfuric acid, beta-propiolactone and vinyl acetate. Incompatible with strong acids, strong oxidizers (perchlorate salts), and chlorinated organic compounds. It is also incompatible with halogenated organic compounds and metal halides. May react with nitromethane and diisopropyl peroxydicarbonate. May ignite on contact with cellulose nitrate. Readily absorbs carbon dioxide from the air to give crusty solid deposits. (NTP, 1992). Ethylenediamine reacts violently with ethylene chlorohydrin. (Lewis, R.J., Sr. 1992. Sax's Dangerous Properties of Industrial Materials, 8th Edition. New York: Van Nostrand Reinhold. pp. 1554.).

Conditions to avoid

no data available

Incompatible materials

Carbon disulfide reacts violently with ... ethylenediamine.

Hazardous decomposition products

When heated to decomp it emits toxic fumes of /nitrogen oxides and ammonia/.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat oral 500 mg/kg

Inhalation: no data available

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

Cancer Classification: Group D Not Classifiable as to Human Carcinogenicity

Reproductive toxicity

no data available

STOT-single exposure

The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion.

STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation may cause asthma.

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 *Pimephales promelas* (fathead minnow) 115.7 mg/l/96 hr @ 22 deg C (95% confidence limit 98.6-131.6 mg/l) /Static bioassay

Toxicity to daphnia and other aquatic invertebrates: LC50 *Daphnia magna* 0.88 mg/l /Conditions of bioassay not specified

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

In one standard dilution test using non-acclimated sewage seed, 24 and 47% of the theoretical BOD was removed after 5 and 20 days, respectively, in fresh water, and 2 and 16%, respectively, in salt water(1). In a second standard dilution test using non-acclimated sewage seed, 0.6 and 17% BOD was removed in 5 days using fresh and salt water, respectively(2). The concentration of the ethylenediamine was 7 to 10 ppm in both studies(1,2). Using acclimated activated sludge, 97.5% COD was removed at a rate of 9.8 mg COD/g/hr (3), 67% of the theoretical BOD was removed in 5 days in a second study(4) and 36 and 70% of the theoretical BOD was removed in 5 and 20 days, respectively, in a third study(1). Ethylenediamine, at a concentration of 100 mg/l, showed a 93 to 95% theoretical BOD loss over a 28 day period in the Japanese MITI test using an activated sludge inoculum(5).

Bioaccumulative potential

An estimated BCF of less than 1 was calculated for ethylenediamine(SRC), using a log Kow of -2.04(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.

Mobility in soil

Ethylenediamine has two primary amine groups and at the pH range found in most soils it is expected to be partially protonated given a pKa1 of 10.7 and a pKa2 of 7.6(1). An average Koc of 4766 (range=2071 to 6160) was measured for ethylenediamine in six different soils; five were from the vadose zone and one from an aquifer (saturated zone)(2). pH values ranged from 6.0 to 9.6 and the fraction of organic carbon from 0.0024 to 0.0391 for this group of soils. Soils with increased cation exchange capacity and organic content had greater affinity for ethylenediamine(2).

Other adverse effects

no data available

SECTION 13: Disposal considerations

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

UN Number

ADR/RID: UN1604 (For reference only, please check.)

IMDG: UN1604 (For reference only, please check.)

IATA: UN1604 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: ETHYLENEDIAMINE (For reference only, please check.)

IMDG: ETHYLENEDIAMINE (For reference only, please check.)

IATA: ETHYLENEDIAMINE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 8 (For reference only, please check.)

IMDG: 8 (For reference only, please check.)

IATA: 8 (For reference only, please check.)

Packing group, if applicable

ADR/RID: II (For reference only, please check.)

IMDG: II (For reference only, please check.)

IATA: II (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information**Safety, health and environmental regulations specific for the product in question****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.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

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

The symptoms of asthma often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Anyone who has shown symptoms of asthma due to this substance should never again come into contact with this substance. Do NOT take working clothes home.

Disclaimer: 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. We as supplier shall not be held liable for any