TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Corrosive to eyes and skin on contact.** **Flammable material; avoid heat and sources of ignition.** **Harmful compound, minimize exposure.** **Lachrymator.** **This compound is a skin sensitizer.** **Hygroscopic -- keep container tightly sealed.** **Air and moisture sensitive material.** **Store under inert gas.**	

Section I. Chemical Product and Company Identification

Chemical Name: **Ethylenediamine Anhydrous**

Catalog Number	E0077
Synonym	1,2-Ethanediamine (CA INDEX NAME)
Chemical Formula	$C_2H_8N_2$
CAS Number	107-15-3

Supplier: TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

In case of Emergency Call: **Chemtrec®**
(800) 424-9300 (U.S.)
(703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Ethylenediamine Anhydrous	107-15-3	Min. 98.0 (GC,T)	Not available.	Rat LD_{50} (oral) 1200 mg/kg Rabbit LD_{50} (dermal) 730 uL/kg Mouse LD_{50} (inhalation) 300 mg/m^3

Section III. Hazards Identification

Acute Health Effects

Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested.
Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death.
Skin contact may result in sensitization. Always cover all exposed skin with an impermeable layer and use proper eye protection. A OSHA/MSHA approved dust and vapor respirator is required when working with this material.
Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects

CARCINOGENIC EFFECTS : Not available.
MUTAGENIC EFFECTS : Not available.
TERATOGENIC EFFECTS : Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

Section IV. First Aid Measures

Eye Contact

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact

In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Inhalation

If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.

Ingestion

DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

Section V. Fire and Explosion Data

Flammability	Flammable.	Auto-Ignition	385℃ (725℉)
Flash Points	34℃ (93.2℉).	Flammable Limits	LOWER: 2.5% UPPER: 16.6%

Combustion Products

These products are toxic carbon oxides (CO, CO_2), nitrogen oxides (NO, NO_2).

Fire Hazards

Not available.

Explosion Hazards

Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Continued on Next Page

Emergency phone number (800) 424-9300

Fire Fighting Media and Instructions	Flammable liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Consult with local fire authorities before attempting large scale fire-fighting operations.

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Corrosive material. Flammable material. Harmful material. Lachrymatory agent. This material is a skin sensitizer. Hygroscopic material. Air sensitive material. Keep away from heat. Mechanical exhaust required. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. DO NOT get water inside container. DO NOT touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information	CORROSIVE. FLAMMABLE. HARMFUL. LACHRYMATOR. SENSITIZER. HYGROSCOPIC. AIR SENSITIVE. STORE UNDER INERT GAS. Keep container dry. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. Wear suitable protective clothing. If you feel unwell, seek medical attention and show the label when possible. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, metals, acids, moisture.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash station and safety shower is proximal to the work-station location.
Personal Protection	Face shield. Lab coat. Vapor respirator. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent. 
Exposure Limits	Not available.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Liquid. (Clear, colorless.)	Solubility	Freely soluble in water, forming a hydrate, and alcohol. Soluble in benzene unless insufficiently dried. Slightly soluble in ether. Very slightly soluble in heptane.
Specific Gravity	0.90 (water=1)		
Molecular Weight	60.10	Partition Coefficient	LOG P_{ow}: -1.2
Boiling Point	116°C (240.8°F)	Vapor Pressure	1.4 kPa (@ 20°C)
Melting Point	8.5°C (47.3°F) 10°C (50°F) (freezing point)	Vapor Density	2.1 (Air = 1)
Refractive Index	1.46	Volatility	Not available.
Critical Temperature	Not available.	Odor	Ammoniacal.
Viscosity	Not available.	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light. Air sensitive. Hygroscopic; keep container tightly closed. Store under inert gas.
Incompatibilities	Reactive with oxidizing agents, metals, acids, moisture, halogens, aldehydes. Attacks metals and rubbers. Reacts violently with chlorinated compounds, strong oxidizing agents, and acids, causing fire and explosion hazard. Readily absorbs carbon dioxide from the air to form a nonvolatile carbonate.

Section XI. Toxicological Information

RTECS Number	KH8575000
Routes of Exposure	Eye Contact. Ingestion. Inhalation. Skin contact.
Toxicity Data	Rat LD_{50} (oral) 1200 mg/kg Rabbit LD_{50} (dermal) 730 uL/kg Mouse LD_{50} (inhalation) 300 mg/m^3 Not available.
Chronic Toxic Effects	**CARCINOGENIC EFFECTS** : Not available. **MUTAGENIC EFFECTS** : Not available. **TERATOGENIC EFFECTS** : Not available. **DEVELOPMENTAL TOXICITY**: Not available. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

Continued on Next Page

Acute Toxic Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Skin contact may result in sensitization. Always cover all exposed skin with an impermeable layer and use proper eye protection. A OSHA/MSHA approved dust and vapor respirator is required when working with this material. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	Ethylenediamine is produced in large quantities and large amounts of the chemical may be released, as emissions and in wastewater during its production and use as a chemical intermediate. Despite its wide use, no monitoring data or information concerning concentrations in effluents could be located. If released to air, a vapor pressure of 12.1 mm Hg at 25 deg C indicates ethylenediamine will exist solely as a vapor in the ambient atmosphere. Vapor-phase ethylenediamine will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 6 hours. In the atmosphere, ethylenediamine should react with photochemically-produced hydroxyl radicals and carbon dioxide to form the insoluble carbonate. It will also be scavenged by rain. If released to soil, ethylenediamine is expected to have slight mobility based upon an average Koc of 4766. Volatilization from moist soil surfaces is not expected to be an important fate process based upon a Henry's Law constant of 1.73X10-9 atm-cu m/mole. Ethylenediamine may volatilize from dry soil surfaces based upon its vapor pressure. However, adsorption to soil may attenuate volatilization. If released into water, ethylenediamine is expected to adsorb to suspended solids and sediment in water based upon the average Koc value. Based on aerobic screening studies, biodegradation is expected to be the most important degradation process for this compound in the environment but no experimental rates in water or soil are available. Biodegradation of ethylenediamine using sewage inocula ranged from 47 to 95% loss of the theoretical BOD over 2 to 3 weeks. Volatilization from water surfaces is not expected to be an important fate process based upon this compound's Henry's Law constant. As ethylenediamine has two primary amine groups, at the pH range found in most environmental waters, it is expected to be partially protonated; the dissociated form will not volatilize.

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.

Section XIV. Transport Information

DOT Classification	DOT CLASS 8: Corrosive material DOT CLASS 3: Flammable liquid
PIN Number	UN1604
Proper Shipping Name	Ethylenediamine
Packing Group (PG)	II
DOT Pictograms	

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS E: Corrosive liquid. On DSL.
EINECS Number (EEC)	203-468-6
EEC Risk Statements	R10- Flammable. R18- In use, may form flammable/explosive vapor-air mixture. R20/21/22- Harmful by inhalation, in contact with skin and if swallowed. R34- Causes burns. R42/43- May cause sensitization by inhalation and skin contact.
Japanese Regulatory Data	ENCS No. 2-150

Section XVI. Other Information

Version 1.0
Validated on 9/3/2009.
Printed 9/3/2009.

Notice to Reader

Printed 9/3/2009.