Material Safety Data Sheet
Ethylenediamine 70%

Section 1 - Chemical Product and Company Identification

MSDS Name:
Ethylenediamine 70%

Catalog Numbers:
LC14140

Synonyms:
1,2-Diaminoethane; 1,2-Ethanediame; Dimethylenediamine; EDA.

Company Identification:
LabChem Inc
200 William Pitt Way
Pittsburgh, PA 15238

Company Phone Number:
(412) 826-5230

Emergency Phone Number:
(800) 424-9300

CHEMTREC Phone Number:
(800) 424-9300

Section 2 – Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name:</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>107-15-3</td>
<td>Ethylenediamine</td>
<td>70</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>balance</td>
</tr>
</tbody>
</table>

Section 3 - Hazards Identification

Emergency Overview

Appearance: Colorless, viscous liquid

Danger: Causes eye and skin burns. Causes digestive and respiratory tract burns. Flammable liquid and vapor. May cause allergic respiratory and skin reaction. Harmful if absorbed through the skin. May be harmful if swallowed or inhaled. Hygroscopic (absorbs moisture from the air).

Target Organs: Kidneys, liver, lungs, eyes, skin, mucous membranes.

Potential Health Effects

Eye:
Causes eye burns. Low vapor concentrations may cause a temporary visual disturbance known as 'blue haze' or 'halo vision'. Lachrymator (substance which increases the flow of tears).

Skin:
Harmful if absorbed through the skin. Causes skin burns. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Undiluted EDA is corrosive to rabbit skin, causing complete tissue destruction after 6 to 12 minutes.
Ingestion:
Causes gastrointestinal tract burns. May cause liver and kidney damage. May be harmful if swallowed.

Inhalation:
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 asthma.

Chronic:
May cause liver and kidney damage. Repeated exposure may cause allergic respiratory reaction (asthma).

Section 4 - First Aid Measures

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:
Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:
Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.

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

Notes to Physician:
Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, thermal decomposition or combustion may generate irritating and highly toxic gases. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Extinguishing Media:
Solid streams of water may be ineffective and spread material. Use water spray, dry chemical, "alcohol resistant" foam, or carbon dioxide.

Autoignition Temperature:
Not applicable.

Flash Point:
Not applicable.

NFPA Rating:
(estimated) Health: 3; Flammability: 3; Instability: 0

Explosion Limits:
Lower: n/a Upper: n/a
Section 6 - Accidental Release Measures

General Information:
Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:
Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. Evacuate unnecessary personnel. Approach spill from upwind. Use water spray to cool and disperse vapors, protect personnel, and dilute spills to form nonflammable mixtures.

Section 7 - Handling and Storage

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. 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. Keep away from heat, sparks and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Do not breathe vapor or mist. Use only with adequate ventilation or respiratory protection.

Storage:
Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Store protected from moisture. Do not store in copper or copper alloy storage vessels.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylenediamine</td>
<td>10 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous route</td>
<td>10 ppm TWA; 25 mg/m³ TWA 1000 ppm IDLH</td>
<td>10 ppm TWA; 25 mg/m³ TWA</td>
</tr>
<tr>
<td>Water</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs:
Ethylenediamine: 10 ppm TWA; 25 mg/m³ TWA.

Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
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Skin:
Wear appropriate gloves to prevent skin exposure.

Clothing:
Wear appropriate protective clothing to prevent skin exposure.

Respirators:
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless, clear</td>
</tr>
<tr>
<td>Odor</td>
<td>Ammonia-like</td>
</tr>
<tr>
<td>pH</td>
<td>11.9 (25% aq soln)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Freezing/Melting Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Specific Gravity/Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Section 10 - Stability and Reactivity

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

Conditions to Avoid:
Incompatible materials, ignition sources, excessive heat, confined spaces.

Incompatibilities with Other Materials:
Strong oxidizing agents, strong acids, copper, copper alloys.

Hazardous Decomposition Products:
Nitrogen oxides, carbon monoxide, carbon dioxide, ammonia and/or derivatives.

Hazardous Polymerization:
Has not been reported.

Section 11 - Toxicological Information

RTECS:
CAS# 107-15-3: KH8575000.
CAS# 7732-18-5: ZC0110000.

LD50/LC50:
CAS# 107-15-3:
Draize test, rabbit, eye: 750 ug Severe;
Draize test, rabbit, eye: 750 ug/24H Severe;
Inhalation, mouse: LC50 = 300 mg/m3;
Oral, mouse: LD50 = 1 gm/kg;
Oral, rat: LD50 = 1200 mg/kg;
Skin, rabbit: LD50 = 730 uL/kg
CAS# 7732-18-5:
   Oral, rat: LD50 = >90 mL/kg
Carcinogenicity:
   CAS# 107-15-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
   CAS# 7732-18-5: Not listed 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 found
Reproductive: No information found
Mutagenicity: No information found
Neurotoxicity: No information found

Section 12 - Ecological Information

Ecotoxicity:
   Fish: Fathead Minnow: LC50 = 115.7 mg/L; 96 Hr.; Static Condition
   Fish: Rainbow trout: LC50 = 230.0 mg/L; 96 Hr.; Static Condition
   Water flea EC50 = 0.88 mg/L; 48 Hr.; Unspecified
   Bacteria: Phytobacterium phosphoreum: EC50 = 20.0 mg/L; 15 Minutes; Microtox test Chub (fresh water) 60ppm/24H (lethal)
   Rainbow trout LC50=230 mg/L/48H
Environmental:
   On soil, substance will leach and volatilize. In water, substance will form alkaline solution and will biodegrade. Bioconcentration is not predicted. In air, substance will react with hydroxyl radicals and carbon dioxide. Biological Oxygen Demand (BOD): 75% (theory), 5 days.

Section 13 - Disposal Considerations

Dispose of in accordance with Federal, State, and local regulations.

Section 14 - Transport Information

US DOT
   Shipping Name: ETHYLENEDIAMINE
   Hazard Class: 8
   UN Number: UN1604
   Packing Group: II
Section 15 - Regulatory Information

US Federal
TSCA:
   CAS# 107-15-3 is listed on the TSCA Inventory.
   CAS# 7732-18-5 is listed on the TSCA Inventory.
SARA Reportable Quantities (RQ):
   CAS# 107-15-3: 5000 lb final RQ; 2270 kg final RQ
CERCLA/SARA Section 313:
   No chemicals are reportable under Section 313.
OSHA - Highly Hazardous:
   None of the chemicals in this product are considered highly hazardous by OSHA.

US State
State Right to Know:
   CAS# 107-15-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
   CAS# 7732-18-5 is not listed on the following state right to know lists: California, Florida, New Jersey, Pennsylvania, Minnesota, Massachusetts.
California Regulations:
   None.

European/International Regulations
Canadian DSL/NDSL:
   CAS# 107-15-3 is listed on Canada's DSL List.
   CAS# 7732-18-5 is listed on Canada’s DSL List.
Canada Ingredient Disclosure List:
   CAS# 107-15-3 is listed on the Canadian Ingredient Disclosure List.
   CAS# 7732-18-5 is not listed on the Canadian Ingredient Disclosure List.

Section 16 - Other Information

MSDS Creation Date: November 15, 2007
Revision Date: November 19, 2007

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