1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Ammonia solution

Product Number: 392685
Brand: Sigma-Aldrich
Company: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
 Telephone: +18003255832
Fax: +18003255052
Emergency Phone #: (314) 776-6555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Formula: H$_3$N

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>200-578-6</td>
<td>603-002-00-5</td>
</tr>
<tr>
<td>Ammonia, anhydrous</td>
<td>7664-41-7</td>
<td>231-635-3</td>
<td>007-001-00-5</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid, Target Organ Effect, Corrosive

Target Organs
Nerves., Liver, Heart, Lungs, Central nervous system, Kidney

HMIS Classification
Health hazard: 4
Chronic Health Hazard: *
Flammability: 3
Physical hazards: 1

NFPA Rating
Health hazard: 4
Fire: 3
Reactivity Hazard: 0

Potential Health Effects
### Inhalation
May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

### Skin
May be harmful if absorbed through skin. Causes skin burns.

### Eyes
May be harmful if absorbed through skin. Causes skin burns.

### Ingestion
May be harmful if swallowed. Causes burns.

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### 4. FIRST AID MEASURES

#### General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

#### If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

#### In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

#### In case of eye contact
Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

#### If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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### 5. FIRE-FIGHTING MEASURES

#### Flammable properties
- Flash point: 3 °C (37 °F) - closed cup
- Ignition temperature: no data available

#### Suitable extinguishing media
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.

#### Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

#### Further information
Use water spray to cool unopened containers.

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### 6. ACCIDENTAL RELEASE MEASURES

#### Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

#### Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

#### Methods for cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

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### 7. HANDLING AND STORAGE

#### Handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>TWA</td>
<td>1,000 ppm</td>
<td>2008-01-01</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Remarks
- Eye & Upper Respiratory Tract irritation
- Central Nervous System impairment
- Adopted values or notations enclosed are those for which changes are proposed in the NIC 2008 Revision or addition to the notice of intended changes See Notice of Intended Changes (NIC) Not classifiable as a human carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

<table>
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<th>Value</th>
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<th>Basis</th>
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</thead>
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<td>TWA</td>
<td>1,000 ppm</td>
<td>1,900 mg/m3</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td>TWA</td>
<td>1,000 ppm</td>
<td>1,900 mg/m3</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
</tbody>
</table>

The value in mg/m3 is approximate.

Ammonia, anhydrous

TWA 25 ppm

Remarks
- Upper Respiratory Tract irritation
- Eye damage

| STEL | 35 ppm          | 2007-01-01 | USA. ACGIH Threshold Limit Values (TLV) |

Upper Respiratory Tract irritation
- Eye damage

| STEL | 35 ppm | 1989-01-19 | USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000 |
| STEL | 27 mg/m3 | 1989-01-19 | USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000 |
| TWA  | 50 ppm | 1989-01-19 | USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000 |

The value in mg/m3 is approximate.
Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (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. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves.

Eye protection
Tightly fitting safety goggles. Faceshield (8-inch minimum).

Skin and body protection
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form liquid

Safety data
pH no data available
Melting point no data available
Boiling point 60 °C (140 °F) at 1,013 hPa (760 mmHg)
Flash point 3 °C (37 °F) - closed cup
Ignition temperature no data available
Lower explosion limit no data available
Upper explosion limit no data available
Density 0.785 g/cm3
Water solubility no data available

10. STABILITY AND REACTIVITY

Storage stability
Stable under recommended storage conditions.

Conditions to avoid
Heat, flames and sparks.

Materials to avoid
Zinc, Oxidizing agents, Alkali metals, Iron, Ammonia, Aldehydes, Alcohols, Peroxides, acids, Copper, Halogens, Cadmium/cadmium oxides, Silver/silver oxides

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Hazardous reactions
Vapours may form explosive mixture with air.
11. TOXICOLOGICAL INFORMATION

Acute toxicity  
no data available

Irritation and corrosion  
no data available

Sensitisation  
no data available

Chronic exposure

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs and Symptoms of Exposure

Central nervous system depression, narcosis, Nausea, Dizziness, Damage to the heart., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Potential Health Effects

Inhalation May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Skin May be harmful if absorbed through skin. Causes skin burns.

Eyes Causes eye burns.

Ingestion May be harmful if swallowed. Causes burns.

Target Organs Nerves., Liver, Heart, Lungs, Central nervous system, Kidney,

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)  
no data available

Ecotoxicity effects  
no data available

Further information on ecology  
no data available

13. DISPOSAL CONSIDERATIONS

Product  
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. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging  
Dispose of as unused product.

14. TRANSPORT INFORMATION
DOT (US)
UN-Number: 1170  Class: 3  Packing group: II
Proper shipping name: Ethanol solutions
Reportable Quantity (RQ): 2421 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN-Number: 1170  Class: 3  Packing group: II  EMS-No: F-E, S-D
Proper shipping name: ETHANOL SOLUTION
Marine pollutant: No

IATA
UN-Number: 1170  Class: 3  Packing group: II
Proper shipping name: Ethanol solution

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid, Target Organ Effect, Corrosive

DSL Status
All components of this product are on the Canadian DSL list.

SARA 302 Components
Ammonia, anhydrous  CAS-No. 7664-41-7  Revision Date 2007-03-01

SARA 313 Components
Ammonia, anhydrous  CAS-No. 7664-41-7  Revision Date 2007-03-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
Ethanol  CAS-No. 64-17-5  Revision Date 2007-03-01
Ammonia, anhydrous  7664-41-7  2007-03-01

Pennsylvania Right To Know Components
Ethanol  CAS-No. 64-17-5  Revision Date 2007-03-01
Ammonia, anhydrous  7664-41-7  2007-03-01

New Jersey Right To Know Components
Ethanol  CAS-No. 64-17-5  Revision Date 2007-03-01
Ammonia, anhydrous  7664-41-7  2007-03-01

California Prop. 65 Components
This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

16. OTHER INFORMATION

Further information
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