

## SAFETY DATA SHEET

Version 3.17  
Revision Date 12/02/2015  
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**1. PRODUCT AND COMPANY IDENTIFICATION****1.1 Product identifiers**

Product name : Ammonium hydroxide solution  
Product Number : 320145  
Brand : Sigma-Aldrich

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

Identified uses : Laboratory chemicals, Synthesis of substances

**1.3 Details of the supplier of the safety data sheet**

Company : Sigma-Aldrich  
3050 Spruce Street  
SAINT LOUIS MO 63103  
USA  
Telephone : +1 800-325-5832  
Fax : +1 800-325-5052

**1.4 Emergency telephone number**

Emergency Phone # : (314) 776-6555

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**2. HAZARDS IDENTIFICATION****2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Acute toxicity, Oral (Category 4), H302  
Skin corrosion (Category 1), H314  
Serious eye damage (Category 1), H318  
Acute aquatic toxicity (Category 1), H400

For the full text of the H-Statements mentioned in this Section, see Section 16.

**2.2 GHS Label elements, including precautionary statements**

Pictogram



Signal word

Danger

Hazard statement(s)

H302 Harmful if swallowed.  
H314 Causes severe skin burns and eye damage.  
H318 Causes serious eye damage.  
H400 Very toxic to aquatic life.

Precautionary statement(s)

P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you

|  |  |
|--|--|
| P301 + P330 + P331<br>P303 + P361 + P353 | feel unwell. Rinse mouth.<br>IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  |
| P304 + P340 + P310                       | IF ON SKIN (or hair): Take off immediately all contaminated clothing.<br>Rinse skin with water/shower.   |
| P305 + P351 + P338 + P310                | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.<br>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. |
| P363                                     | Wash contaminated clothing before reuse.   |
| P391                                     | Collect spillage.  |
| P405                                     | Store locked up.   |
| P501                                     | Dispose of contents/ container to an approved waste disposal plant.  |

### 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Lachrymator.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.2 Mixtures

Synonyms : Ammonia aqueous  
Ammonia water

Formula : H<sub>5</sub>NO

#### Hazardous components

| Component                 | Classification | Concentration  |
|---------------------------|----------------|----------------|
| <b>Ammonium hydroxide</b> |                |                |
| CAS-No.                   | 1336-21-6      | >= 50 - < 70 % |
| EC-No.                    | 215-647-6      |                |
| Index-No.                 | 007-001-01-2   |                |

For the full text of the H-Statements mentioned in this Section, see Section 16.

## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

#### General advice

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

#### If inhaled

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

#### In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

#### In case of eye contact

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

#### If swallowed

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

### 4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### 4.3 Indication of any immediate medical attention and special treatment needed

No data available

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## 5. FIREFIGHTING MEASURES

### 5.1 Extinguishing media

#### Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

### 5.2 Special hazards arising from the substance or mixture

Nitrogen oxides (NO<sub>x</sub>)

### 5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

### 5.4 Further information

No data available

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## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

For personal protection see section 8.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

### 6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

### 6.4 Reference to other sections

For disposal see section 13.

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## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature 2 - 8 °C

May develop pressure. Refrigerate before opening. Handle and open container with care.

Storage class (TRGS 510): Non-combustible, corrosive hazardous materials

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

#### Components with workplace control parameters

| Component          | CAS-No.   | Value  | Control parameters | Basis                                   |
|--------------------|-----------|--|--------------------|---|
| Ammonium hydroxide | 1336-21-6 | TWA  | 25.000000 ppm      | USA. ACGIH Threshold Limit Values (TLV) |
|                    | Remarks   | Upper Respiratory Tract irritation<br>Eye damage |                    |   |
|                    |           | TWA  | 25.000000 ppm      | USA. ACGIH Threshold Limit Values (TLV) |
|                    |           | Upper Respiratory Tract irritation<br>Eye damage |                    |   |

|  |  |  |                                  |   |
|--|--|--|----------------------------------|---|
|  |  | STEL   | 35.000000 ppm                    | USA. ACGIH Threshold Limit Values (TLV) |
|  |  | Upper Respiratory Tract irritation<br>Eye damage |                                  |   |
|  |  | STEL   | 35.000000 ppm                    | USA. ACGIH Threshold Limit Values (TLV) |
|  |  | Upper Respiratory Tract irritation<br>Eye damage |                                  |   |
|  |  | TWA  | 25.000000 ppm<br>18.000000 mg/m3 | USA. NIOSH Recommended Exposure Limits  |
|  |  | Often used in an aqueous solution.               |                                  |   |
|  |  | TWA  | 25.000000 ppm<br>18.000000 mg/m3 | USA. NIOSH Recommended Exposure Limits  |
|  |  | Often used in an aqueous solution.               |                                  |   |
|  |  | ST   | 35.000000 ppm<br>27.000000 mg/m3 | USA. NIOSH Recommended Exposure Limits  |
|  |  | Often used in an aqueous solution.               |                                  |   |
|  |  | ST   | 35.000000 ppm<br>27.000000 mg/m3 | USA. NIOSH Recommended Exposure Limits  |
|  |  | Often used in an aqueous solution.               |                                  |   |
|  |  | TWA  | 25 ppm                           | USA. ACGIH Threshold Limit Values (TLV) |
|  |  | Upper Respiratory Tract irritation<br>Eye damage |                                  |   |
|  |  | STEL   | 35 ppm                           | USA. ACGIH Threshold Limit Values (TLV) |
|  |  | Upper Respiratory Tract irritation<br>Eye damage |                                  |   |
|  |  | TWA  | 25 ppm<br>18 mg/m3               | USA. NIOSH Recommended Exposure Limits  |
|  |  | Often used in an aqueous solution.               |                                  |   |
|  |  | ST   | 35 ppm<br>27 mg/m3               | USA. NIOSH Recommended Exposure Limits  |
|  |  | Often used in an aqueous solution.               |                                  |   |

## 8.2 Exposure controls

### Appropriate engineering controls

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

### Personal protective equipment

#### Eye/face protection

Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

#### Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

#### Full contact

Material: butyl-rubber

Minimum layer thickness: 0.3 mm

Break through time: 480 min

Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)

#### Splash contact

Material: Nitrile rubber  
Minimum layer thickness: 0.11 mm  
Break through time: 240 min  
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

### Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (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).

### Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

- |   |  |
|---|--|
| a) Appearance                                   | Form: liquid, clear<br>Colour: colourless                        |
| b) Odour  | No data available  |
| c) Odour Threshold                              | No data available  |
| d) pH   | 11.7 at 20 °C (68 °F)  |
| e) Melting point/freezing point                 | -60 °C (-76 °F)  |
| f) Initial boiling point and boiling range      | 38 - 100 °C (100 - 212 °F) at 1,013 hPa (760 mmHg)               |
| g) Flash point                                  | Not applicable   |
| h) Evaporation rate                             | No data available  |
| i) Flammability (solid, gas)                    | No data available  |
| j) Upper/lower flammability or explosive limits | Upper explosion limit: 27 %(V)<br>Lower explosion limit: 16 %(V) |
| k) Vapour pressure                              | 153 hPa (115 mmHg) at 20 °C (68 °F)                              |
| l) Vapour density                               | 1.21 - (Air = 1.0)   |
| m) Relative density                             | 0.9 g/mL at 25 °C (77 °F)  |
| n) Water solubility                             | No data available  |
| o) Partition coefficient: n-octanol/water       | No data available  |
| p) Auto-ignition temperature                    | No data available  |
| q) Decomposition temperature                    | No data available  |
| r) Viscosity                                    | No data available  |

- s) Explosive properties      No data available  
t) Oxidizing properties      No data available

## 9.2 Other safety information

Relative vapour density      1.21 - (Air = 1.0)

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## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

No data available

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

No data available

### 10.4 Conditions to avoid

No data available

### 10.5 Incompatible materials

Copper, Iron, Zinc

### 10.6 Hazardous decomposition products

Other decomposition products - No data available  
In the event of fire: see section 5

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## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

#### Skin corrosion/irritation

No data available

#### Serious eye damage/eye irritation

No data available

#### Respiratory or skin sensitisation

No data available

#### Germ cell mutagenicity

No data available

#### Carcinogenicity

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.

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

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.

#### Reproductive toxicity

No data available

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**Additional Information**

RTECS: Not available

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**12. ECOLOGICAL INFORMATION****12.1 Toxicity**

No data available

**12.2 Persistence and degradability**

No data available

**12.3 Bioaccumulative potential**

No data available

**12.4 Mobility in soil**

No data available

**12.5 Results of PBT and vPvB assessment**

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**12.6 Other adverse effects**

Very toxic to aquatic life.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

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**13. DISPOSAL CONSIDERATIONS****13.1 Waste treatment methods****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**

Dispose of as unused product.

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**14. TRANSPORT INFORMATION****DOT (US)**

UN number: 2672      Class: 8      Packing group: III

Proper shipping name: Ammonia solution

Reportable Quantity (RQ): 1621 lbs

Marine pollutant:yes

Poison Inhalation Hazard: No

**IMDG**

UN number: 2672      Class: 8      Packing group: III      EMS-No: F-A, S-B

Proper shipping name: AMMONIA SOLUTION

Marine pollutant:yes

**IATA**

UN number: 2672      Class: 8      Packing group: III

Proper shipping name: Ammonia solution

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**15. REGULATORY INFORMATION****SARA 302 Components**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

### SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

|                    | CAS-No.   | Revision Date |
|--------------------|-----------|---------------|
| Ammonium hydroxide | 1336-21-6 | 2007-03-01    |

### SARA 311/312 Hazards

Acute Health Hazard

### Massachusetts Right To Know Components

|                    | CAS-No.   | Revision Date |
|--------------------|-----------|---------------|
| Ammonium hydroxide | 1336-21-6 | 2007-03-01    |

### Pennsylvania Right To Know Components

|                    | CAS-No.   | Revision Date |
|--------------------|-----------|---------------|
| Ammonium hydroxide | 1336-21-6 | 2007-03-01    |
| Water              | 7732-18-5 |               |

### New Jersey Right To Know Components

|                    | CAS-No.   | Revision Date |
|--------------------|-----------|---------------|
| Ammonium hydroxide | 1336-21-6 | 2007-03-01    |
| Water              | 7732-18-5 |               |

### California Prop. 65 Components

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

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## 16. OTHER INFORMATION

### Full text of H-Statements referred to under sections 2 and 3.

|                 |  |
|-----------------|--|
| Acute Tox.      | Acute toxicity                                   |
| Aquatic Acute   | Acute aquatic toxicity                           |
| Aquatic Chronic | Chronic aquatic toxicity                         |
| Eye Dam.        | Serious eye damage                               |
| H302            | Harmful if swallowed.                            |
| H314            | Causes severe skin burns and eye damage.         |
| H318            | Causes serious eye damage.                       |
| H400            | Very toxic to aquatic life.                      |
| H411            | Toxic to aquatic life with long lasting effects. |
| Skin Corr.      | Skin corrosion                                   |

### HMIS Rating

|                        |   |
|------------------------|---|
| Health hazard:         | 3 |
| Chronic Health Hazard: |   |
| Flammability:          | 0 |
| Physical Hazard        | 0 |

### NFPA Rating

|                    |   |
|--------------------|---|
| Health hazard:     | 3 |
| Fire Hazard:       | 0 |
| Reactivity Hazard: | 0 |

### Further information

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**Preparation Information**  
Sigma-Aldrich Corporation  
Product Safety – Americas Region  
1-800-521-8956

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