

SIGMA-ALDRICH**Material Safety Data Sheet**Version 3.1
Revision Date 12/03/2009
Print Date 05/20/2010**1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : Ammonium hydroxide solution, 28% NH3 in H2O

Product Number : 338818
Brand : Sigma-Aldrich

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Ammonia aqueous
Ammonia water

CAS-No.	EC-No.	Index-No.	Concentration
Ammonium hydroxide			
1336-21-6	215-647-6	007-001-01-2	57.6 %
Water			
7732-18-5	231-791-2	-	42.4 %

3. HAZARDS IDENTIFICATION**Emergency Overview****OSHA Hazards**

Toxic by ingestion, Corrosive

Other hazards which do not result in classification

Lachrymator.

HMS Classification

Health hazard: 3
Chronic Health Hazard: *
Flammability: 0
Physical hazards: 0

NFPA Rating

Health hazard: 3
Fire: 0
Reactivity Hazard: 0

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Sigma-Aldrich - 338818
Delivery 0835534451-000010 Purchase Order 38047L**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 : Toxic if swallowed. Causes burns.

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

Take off contaminated clothing and shoes immediately. 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.

5. FIRE-FIGHTING MEASURES**Flammable properties**

Flash point : not applicable

Ignition temperature : 651 °C (1,204 °F) -

Suitable extinguishing media

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

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES**Personal precautions**

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

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.

Methods for cleaning up

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

7. HANDLING AND STORAGE**Handling**

Avoid inhalation of vapour or mist.

Normal measures for preventive fire protection.

Storage

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.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

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 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).

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, clear
Colour colourless

Safety data

pH 11.7 at 20 °C (68 °F)
Melting point -60 °C (-76 °F)
Boiling point 38 - 100 °C (100 - 212 °F) at 1,013 hPa (760 mmHg)
Flash point not applicable
Ignition temperature 651 °C (1,204 °F) -
Lower explosion limit 16 %(V)
Upper explosion limit 27 %(V)
Vapour pressure 153 hPa (115 mmHg) at 20 °C (68 °F)
Density 0,9 g/cm³
Water solubility no data available
Relative vapour density 1.21
- (Air = 1.0)

10. STABILITY AND REACTIVITY

Storage stability

Stable under recommended storage conditions.

Materials to avoid

Copper, Iron, Zinc

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - nitrogen oxides (NOx)

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - 350 mg/kg (Ammonium hydroxide)

Remarks: Gastrointestinal:Other changes. Liver:Other changes. Kidney, Ureter, Bladder:Other changes.

Irritation and corrosion

Eyes - rabbit - Severe eye irritation (Ammonium hydroxide)

Sensitisation

no data available (Ammonium hydroxide)

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.

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.

Signs and Symptoms of Exposure

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. (Ammonium hydroxide)

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 Toxic if swallowed. Causes burns.

12. ECOLOGICAL INFORMATION

Elimination Information (persistence and degradability)

no data available

Ecotoxicity effects

Toxicity to fish mortality NOEC - *Oncorhynchus tshawytscha* - 3.5 mg/l - 3 d (Ammonium hydroxide)

Toxicity to daphnia and other aquatic invertebrates. LC50 - *Daphnia magna* (Water flea) - 32 mg/l - 50 h (Ammonium hydroxide)

Further information on ecology

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Product
Observe all federal, state, and local environmental regulations. 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.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 2672 Class: 8 Packing group: III
Proper shipping name: Ammonia solution
Reportable Quantity (RQ): 1736 lbs
Marine pollutant: No
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: No

IATA
UN-Number: 2672 Class: 8 Packing group: III
Proper shipping name: Ammonia solution

15. REGULATORY INFORMATION

OSHA Hazards
Toxic by ingestion, Corrosive

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

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

SARA 313 Components	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
Water	7732-18-5	2007-03-01
Ammonium hydroxide	1336-21-6	2007-03-01

New Jersey Right To Know Components

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