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|  <p>CHEMLABS Quality Our Forte</p> | <p>LEONID CHEMICALS PVT. LTD., BANGALORE</p> <p>An ISO-9001:2008 Certified Company</p> <p>Quality Assurance Department</p> | <p>(CODE) DOCUMENT : WI (CODE) SECTION : WI/SM (DATE) : 01.04.2011</p> |  <p>Issue : 02 Rev.: 00</p> |
| <p>Title: MATERIAL SAFETY DATA SHEET (MSDS): AMMONIUM HYDROXIDE ABT 25%</p> | | <p>1 Page of 1</p> | |

SECTION 1- CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS Name:
Ammonium Hydroxide abt 25%

Catalog Numbers:
A047

Synonyms:
Ammonium hydrate, ammonia solution, ammonia water.

Company Information:
LEONID CHEMICALS Pvt Ltd,
62/A2, 1st Stage,
Yeshvanthpur Industrial Suburb,
Asoka puram School Road,
Bangalore -22, Karnataka, INDIA
Ph- +91-80-23378354
Fax: +918023378354/23377126

SECTION 2- COMPOSITION, INFORMATION ON INGREDIENTS

CAS # : 1336-21-6
Chemical Name : Ammonium hydroxide abt 25 % Sp.Gr.0.91
% : 25 %
EINECS# : 215-647-6
Hazard Symbols : None Listed.
Risk Phrases : None Listed.



SECTION 3- HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
No information available.

Potential Health Effects

Eye:
Contact with liquid or vapor causes severe burns and possible irreversible eye damage.

Skin:
Causes severe skin irritation. Causes skin burns. May cause deep, penetrating ulcers of the skin.

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May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. Causes throat constriction, vomiting, convulsions, and shock.

Inhalation:

Effects may be delayed. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma.

Chronic:

Prolonged inhalation may cause respiratory tract inflammation and lung damage. Chronic ingestion may cause effects similar to those of acute ingestion. Prolonged or repeated exposure may cause corneal damage and the development of cataracts and glaucoma.

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 immediately.

Skin:

Get medical aid immediately. Rinse area with large amounts of water for at least 15 minutes.

Ingestion:

Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation:

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



Notes to Physician:

Information not available.

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. Contact with combustible materials may cause a fire.

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Extinguishing Media:

For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

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. Neutralize spill with sodium bicarbonate.

SECTION 7 -HANDLING AND STORAGE

Handling:

Wash thoroughly after handling. Use only in a well-ventilated area. Do not get on skin or in eyes. Do not ingest or inhale.

Storage:

Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances.

SECTION 8 -EXPOSURE CONTROLS, PERSONAL PROTECTION

Engineering Controls:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protective Equipment

Eyes:

Wear safety glasses with side shields.

Skin:



Wear appropriate protective 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. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

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SECTION 9 -PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---------------------------|--------------------------------|
| Physical State | : Liquid |
| Color | : Colorless. |
| Odor | : Strong ammonia odor. |
| pH | : 13.6 at 32F |
| Vapor Pressure | : 237.8 mm Hg |
| Viscosity | : Information not available. |
| Boiling Point | : 82.4 deg F |
| Freezing/Melting Point | : -106.6 °F/for ammonia |
| Auto ignition Temperature | : 1202 °F (650.00 ° C) |
| Flash Point | : Not applicable. |
| Explosion Limits, lower | : 16 |
| Explosion Limits, upper | : 25 |
| Decomposition Temperature | : Information not available. |
| Solubility in water | : Completely soluble in water. |
| Specific Gravity/Density | : 0.9 g/mL at 77°F. |
| Molecular Formula | : NH ₄ OH |
| Molecular Weight | : 35.0411 |

SECTION 10 -STABILITY AND REACTIVITY

Chemical Stability:

Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid:

High temperatures, incompatible materials.

Incompatibilities with Other Materials:



Acrolein, acrylic acid, chlorosulfonic acid, dimethyl sulfate, fluorine, gold + aqua regia, hydrochloric acid, hydrofluoric acid, iodine, nitric acid, oleum, propiolactone, propylene oxide, silver nitrate, silver oxide, silver oxide + ethyl alcohol, nitromethane, silver permanganate, sulfuric acid, halogens. Forms explosive compounds with many heavy metals and halide salts.

Hazardous Decomposition Products:

Nitrogen oxides (NO_x) and ammonia (NH₃).

Hazardous Polymerization:

Has not been reported.

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SECTION 11 -TOXICOLOGICAL INFORMATION

RTECS#:

CAS# 1336-21-6: Bq9625000

LD50/LC50:

CAS# 1336-21-6: Draize test, rabbit, eye: 250 ug Severe; Draize test, rabbit, eye: 44 ug Severe; Oral, rat: LD50 = 350 mg/kg.

Carcinogenicity:

Ammonium hydroxide - Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. Other: See actual entry in RTECS for complete information.

SECTION 12 -ECOLOGICAL INFORMATION

Ecotoxicity:

Bluegill LC50=0.024 to 0.093 mg/L/48H Goldfish TLm=2.0 to 2.5 mg/L/24-96H

SECTION 13 -DISPOSAL CONSIDERATIONS

Products which are considered hazardous for supply are classified as Special Waste and the disposal of such chemicals is covered by regulations which may vary according to location. Contact a specialist disposal company or the local waste regulator for advice. Empty containers must be decontaminated before returning for recycling.

SECTION 14 -TRANSPORT INFORMATION

IATA

Shipping Name : AMMONIA SOLUTION

Hazard Class : 8

UN Number : 2672



Packing Group : III

IMO

Shipping Name : AMMONIA SOLUTION

Hazard Class : 8

UN Number : 2672

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Packing Group : III

RID/ADR

Shipping Name : AMMONIA SOLUTION

Hazard Class : 8

UN Number : 2672

Packing group : III

CAS# 1336-21-6: 1000 lb final RQ; 454 kg final RQ

SECTION 15 -REGULATORY INFORMATION

European/International Regulations
European Labeling in Accordance with EC Directives

Hazard Symbols:
No information available.

Risk Phrases:
No information available.

Safety Phrases:
No information available.

WGK (Water Danger/Protection) CAS#
1336-21-6: 2



United Kingdom Occupational Exposure Limits
No information available.

United Kingdom Maximum Exposure Limits
No information available.

Canada
CAS# 1336-21-6 is listed on Canada's DSL List.
CAS# 1336-21-6 is listed on Canada's Ingredient Disclosure List.

Exposure Limits
No information available.

US FEDERAL
TSCA
CAS# 1336-21-6 is listed on the TSCA inventory.

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SECTION 16 -ADDITIONAL INFORMATION

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Leonid Chemicals Pvt. Ltd. be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Leonid Chemicals Pvt. Ltd. has been advised of the possibility of such damages.



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|  | LEONID CHEMICALS PVT. LTD., BANGALORE An ISO-9001:2008 Certified Company Quality Assurance Department | (CODE) DOCUMENT : R/QPM/8.2.4/06 |  |
| | | (CODE) SECTION : A047 | |
| Title: SPECIFICATION MANUAL - AMMONIUM SOLUTION ABT25% | | | Issue : 02 Rev.: 00 1 Page of 2 |

Specification manual - Ammonium solution abt 25%

NH₄OH

Mol Wt: 35.04

Product : Ammonium solution abt 25%
Description : A clear colourless liquid with a strong pungent odour
Cat No : A047
Cas No : 1336-21-6
Prepared Date : 07.03.2005
Approved Date : 07.03.2005

| REVISION HISTORY | | | |
|---------------------|-----------------------|----------------|----------------|
| Issue/Rev | Description of Change | Author | Effective Date |
| 01/00 | Initial Release | S. Paul Joshua | 07.03.2005 |
| 02/00 | Reviewed no changes | S. Paul Joshua | 01.04.2011 |
| Next Review Due : | 02.04.2015 | | |
| To be reviewed by : | Head-QC/QA | | |

| Sl. No. | Tests | Specification |
|---------|----------|---------------|
| | | LR |
| 1 | Assay | 25-28% |
| 2 | Chloride | 0.001% |

Approved By: S.Paul Joshua, Head Quality Control and Quality Assurance