ANCO CHEMICALS INC.
85 MALMO COURT, MAPLE, ONTARIO L6A 1R4
(905) 832-2276 .FAX (905) 832-3701
www.ancochemicals.com

ANCO CHEMICALS INC.

6905 Hebert Street, Ville Ste-Catherine, QC, J5C 1B5
Tel: 450-632-0950

MATERIAL SAFETY DATA SHEET

Product Identification: **Anhydrous Ammonia**

Commercial Grade

Effective Date: Jan. 26, 2016 Page 1/6
24 Hour Emergency Number
CANUTEC'S #: 613-996-6666(call collect) or *666 cellular
Transport Canada Emergency Response Assistance Plan No: ERP 2-0075,
ERAP activation no: 905-832-2276
Chemical Name: Ammonia, Anhydrous or Anhydrous Ammonia, 82-0-0 contains 0.2% water
Synonyms: Ammonia Gas
Chemical Family: Not applicable
Molecular Formula: NH_3
Product Use: Agricultural Fertilizer
Published: Anco Chemicals Inc., Quality Dept., 1-905-832-2276 x 233
Hazardous Ingredients of Product
Hazardous Ingredients: wt % ACGIH TLV CAS. No.
Anhydrous Ammonia 99.7 25ppm 7664-41-7
Regulatory Information
Controlled Products Regulations Classification: A: Compressed Gas; D1B Very Toxic; E: Corrosive
OSHA Hazard Communication (29 CFR1910.1200)
Classification: Toxic and Corrosive
Canadian TDG Act Shipping Description
Shipping Name: Ammonia, Anhydrous; 82-0-0 contains 0.2% water
Shipping Class/Division: 2.3(8)
Product Identification No: UN1005
Placard Toxic 2.3 white or UN1005 color: white
Packing Group: None
Classification: Toxic, corrosive and non-flammable gas
Other Regulations: Toxic gas, Placard colour white
Read the entire MSDS for the complete hazard evaluation of this product.
First Aid Procedures When:
Inhaled: Move victim to fresh air, give artificial respiration only if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing and no pulse. Oxygen administration may be beneficial in this situation but should *only* be administered by personnel trained in its use. Obtain medical attention immediately.

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In Contact with the Skin & Mucosa: If contacted by liquid ammonia, the body area affected should be immediately flooded with water. If no safety shower is available, utilize any available water source. Water will have the effect of thawing out clothing which may be frozen to the skin. Such clothing should be removed and flooding of the skin with water continued for at least 15 minutes. Obtain medical attention promptly.

In Contact with the Eyes: If contacted by ammonia, the eyes must be flooded with copious quantities of clean water. Speed is essential. If contact lenses are worn, they must be removed; otherwise ammonia may be trapped underneath causing a severe burn. In isolated areas, water in a squeeze bottle which can be carried in the pocket is helpful for emergency irrigation purposes. An eye fountain should be used, but if not available, clean water from any source may be poured over the eyes. In any case, the eyelids MUST BE HELD OPEN and irrigation continued for at least 15 minutes. Repeat this procedure every ten minutes for an hour, each time irrigating for a period of five minutes until prompt medical attention can be obtained.

Ingested: Material is a gas and ingestion is not a likely route of exposure. If conscious give 1-2 glasses of milk or water. *Do not* induce vomiting. Obtain medical attention.

Emergency Medical Care: Pulmonary edema may be delayed. Injury may be more severe than would be indicated on early presentation.

Medical conditions that may be aggravated by exposure include asthma, bronchitis, emphysema and other lung diseases and chronic nose, sinus or throat conditions. In the event of skin or eye contact, rapid and through flushing is essential.

Fire & Explosion Data:

Flash Point: Not applicable

Auto ignition Temperature: 651□C

Flammability Limits in Air: UEL:25% LEL:16%

Fire Extinguishing Media: C02, Dry Chemical, Water Spray

Fire Fighting Procedures: Stop flow of gas. Use water to keep fire from exposed containers and to cool and protect personnel effecting the shut-off. Full protective equipment, including a self-contained breathing apparatus, should be worn in a fire involving the material.

ACCIDENTAL RELEASE MEASURES

Spill or Leak Measure: Stop leak if you can do so without risk. Keep unnecessary people away, isolate hazardous area and deny entry. Stay upwind, out of low areas, and ventilate closed spaces before entering. Evaluate the affected area to determine whether to evacuate or shelter-in-place by taping windows and doors, shutting off outside air intake (attic fans, etc.), and placing a wet towel or cloth over the face (if needed). Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection in outdoor releases for short-term exposure. Fully-

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encapsulating, vapour-protective clothing should be worn for spills and leaks with no fire. Use water spray to control vapours. Mixing of water and liquid ammonia will generate heat and ammonia vapours.

CAUTION:

a. Personal protective clothing may become brittle when exposed to liquid ammonia.

b. Runoff from vapour control or dilution may cause environmental damage.

Determining spill size: Generally, a small spill is one which involves a single, small package (i.e. up to a 55 gallon drum), small cylinder, or a small (non continuing) leak from a large container.

Small Spill:

a. Flush area with flooding amounts of water.

b. First isolate 100 feet in all directions, and then protect persons downwind 0.1 miles during daylight and 0.2 miles at night.

Large Spill:

a. Dike far ahead of liquid spill for later disposal.

b. Follow local emergency protocol for handling.

c. First isolate 300 feet in all directions, and then protect persons down wind 0.2 miles during daylight and 0.5 miles at night.

HANDLING AND STORAGE

Handling Procedures and Equipment: Protect cylinders from physical damage. Do not store in basement locations. Keep out of sun and away from all direct heat sources. The material will attack copper, tin, zinc, and their alloys; some forms of rubber, plastics and coatings.

Storage Requirements: Store in cool, dry, well-ventilated area away from incompatibles. Secure cylinders.

Other Precautions: Protect cylinders from physical damage. Do not store in basement locations. Keep out of sun and away from all direct heat sources. The material will attack copper, tin, zinc, and their alloys; some forms of rubber, plastics and coatings. Locate safety shower and eyewash station close to chemical handling area.

EXPOSURE CONTROLS, PERSONAL PROTECTION

This information is based on industrial norms, please note any limits set by the manufacturer of your brand of safety gear.

Odour Threshold: Less than 5ppm

Respiratory Protection Requirements:

<25 ppm: No protection required.

25 to 35 ppm: Protection required if the daily TWA is exceeded.

35 to 50 ppm: Protection required if exposed for more than 15 minutes.

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50 to 250 ppm: Minimum of air-purifying respirator equipped with ammonia canister(s) or cartridge(s).
250 to 300 ppm: Minimum of a full face air—purifying respirator equipped with ammonia canister(s) or cartridge(s).
>300 ppm: A fresh air supply system must be used (i.e. positive pressure self contained breathing apparatus)

Skin Protection Requirements: Skin protection is required for exposure to liquid, mist, and > 1000 ppm of ammonia gas or vapours. Neoprene or rubber gauntlet-type gloves; ammonia resistant clothing (overalls, jacket, and boots) or vapour suit, as required.

Eye Protection Requirements: Use chemical (indirectly vented) goggles when there is a potential for contact with liquid or mist. A full-face shield may be worn over goggles for additional protection, but not a substitute for goggles. In areas where high concentrations (>250) of ammonia vapours may occur a SCBA may be required.

Other Protective Equipment: Safety shower and eyewash fountain should be provided in the ammonia handling area. In agricultural distribution, provide easily accessible shower and / or at least 100 gallons of clean water in open top container (check regulations). When transporting, provide at least 5 gallons of accessible clean water and personal protective equipment.

Engineering Controls: Adequate ventilation is required to keep ammonia concentrations below applicable standards when possible.

Note to the Physician: Pneumonitis should be anticipated after inhalation or ingestion. If severe exposure is suspected, observe for 48-72 hours for delayed pulmonary edema.

Medical Conditions Aggravated by Exposure: Chronic respiratory or skin disease.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Form…….Gas (liquid under pressure)
Color……..Colorless gas and liquid, forms white vapour in contact with moisture.
Odour…….Strong pungent penetrating odour, ammonia.
Boiling Point……..-28.1□F
Melting Point…….-107.9□F
pH……..>13.0 (neat)
Solubility……35g/100g in water at 32□F
Specific Gravity…….0.62 (@ 60□F)
Vapour Density……..0.60 (@ 60□F)
Vaour Pressure……..93 psig (@ 60□F)
% Volatile by Volume……100%
Molecular Weight……..17.03
Density……5.14 lb. Per U.S. gallon (@ 60 □F)
Critical temperature……271□F
Critical pressure……..1636 psia

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REACTIVITY

Stability……This is a stable material.
Hazardous Polymerization……Will not occur.
Conditions to avoid……..Excessive heat.
Decomposition: May form oxides of nitrogen. Hydrogen is released on heating above 850□F (454□C). At 1290□F or in presence of electric spark ammonia decomposes into nitrogen and hydrogen gases, which may form a flammable mixture in the air.
Incompatibilities:
a. Ammonia has potentially explosive or violent reactions with interhalogens, strong oxidizers, Nitric Acid, Fluorine, Nitrogen oxide, etc. (See note following).

b. Ammonia forms sensitive explosive mixtures with air and hydrocarbons, Ethanol, and Silver Nitrate, Chlorine, etc. (see note following)

c. Explosive products are formed by the reaction of ammonia with Silver Chloride, Silver Oxide, Bromine, Iodine, Gold, Mercury, Tellurium Halides, etc. (see note following).

d. Ammonia is incompatible or has potentially hazardous reactions with Silver, Acetaldehyde, Acrolein, Boron, Halogens, Perchlorate, Chloric Acid, Chlorine Monoxide, Chlorides, Nitrogen Tetroxide, Tin, Sulphur, etc. (see note following).

NOTE: The incompatibilities above are a partial list taken from two books by Sax & Lewis: "Dangerous Properties of Industrial Materials", 7th ed., 1989 and Hawley's "Condensed Chemical Dictionary", 11th ed. 1987, both published by Van Nostrand Reinhold Company, New York. It is recommended that if additional information is needed, refer to these and other published information.

TOXICOLOGICAL INFORMATION

LC50 Mouse……2115 ppm for 4 hrs.
LD50 Rat……350 mg/kg
LC60 Goldfish/Yellow Perch……..2.0 to 2.5 ppm / 1 to 4 d
Carcingenicity Data: The ingredients of this product are not listed as carcinogens by NTP, (National Toxicology Program), not required as carcinogens by OSHA (Occupational Safety and Health Administration), and have not been evaluated by IARC (International Agency for Research on Cancer) or ACGIH (American Conference of Governmental Industrial Hygienists).
Reproductive Effects: No information is available and no adverse reproductive effects are anticipated.
Mutagenicity Data: No information is available and no adverse mutagenic effects are anticipated.
Teratogenicity Data: No information is available and no adverse teratogenic effects are anticipated.
Synergistic Materials: None known.

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ECOLOGICAL INFORMATION

a. Ammonia is harmful to aquatic life in very low concentration and may be hazardous if it enters water intakes.

b. Local health and wildlife authorities, as well as operators of water intakes in the vicinity, should be notified of water releases.

c. Waterfowl toxicity: 120 ppm

d. Ammonia does not concentrate in the food chain.

e. BOD curve for ammonia begins after several days. At this time bacteria will convert it to nitrates.

f. Effect on water treatment process: Chlorination will produce chloramines which are more readily detected by taste and odour.

DISPOSAL INFORMATION

Reclaim as fertilizer if possible; otherwise dispose of in accordance with federal, provincial, and local environmental control regulations. Do not dispose of wastes in local sewerage system.

TRANSPORTATION INFORMATION

TC ERAP No:……2-0075
D.O.T. Shipping Name……..Anhydrous ammonia
U S D.O.T. Hazard Class…… Non-flammable gas, class 2.2
U.N. Number……..UN1005
U S D.O.T. Placard…… Non-flammable gas 2.2, colour: green
OSHA Label required……Yes
STCC Number……49 042 10

Additional Information and Sources Used

1. RTEC-S Registry of Toxic effects of Chemical substances, On-line search, Canadian Centre for Occupational Safety & Health, US Department of Health and Human Services, Cincinnati, 1992.
2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd Ed., Vol II
3. Supplier's Material Safety Data Sheets.
4. Hazardous Material Spill Manual, Que. 1977.
5. NOISH, Criteria for a Recommended Standard to Ammonia.
6. "Dangerous Properties of Industrial Materials" 7th Ed. 1989
7. "Hawley's Condensed Chemical Dictionary" 11th Ed. 1987
8. "Anhydrous Ammonia Safety" LaRoche Industries 1989
9. Clear Language TDGR (effective 15th Aug. 2002)
10. Changed Canadian classification from 2.2 to 2.3