



Tel: 514-956-7503
Fax: 514-956-7504
Internet: www.megs.ca
E-mail:
support@megs.ca

Montreal

St-Laurent

Tel : 514-956-7503

Fax : 514-956-7504

Ottawa

Nepean

Tel : 613-226-4228

Fax : 613-226-4229

Quebec

Quebec

Tel : 418-834-7447

Fax : 418-834-3774

MSDS: Ammonia Anhydrous

PRODUCT INFORMATION

PRODUCT: Ammonia Anhydrous

TRADE NAME: Ammonia, Anhydrous

CHEMICAL NAME: Anhydrous Ammonia

SYNONYMS: Ammonia, Anhydrous, Liquefied

FORMULA: NH₃

CHEMICAL FAMILY: Nitrogen Hydride

SUPPLIER'S NAME: MEGS Inc.

SUPPLIER'S ADDRESS: 2675 De Miniac

Ville St-Laurent, Qc, H4S 1E5

EMERGENCY PHONE NUMBER: (514) 956-7503

MOLECULAR WEIGHT: 17.03

PRODUCT USE: Various

PRODUCT IDENTIFICATION UN 1005

NUMBER:

HAZARDOUS INGREDIENTS

| CHEMICAL ID | CONCENTRATION | CAS # | LD(50) | LC(50) |
|-------------|---------------|-----------|----------------------|-------------------------|
| | 99+% | | | |
| Ammonia | | 7664-41-7 | Oral-Rat 350mg/kg | Inhl-Rat 2000 ppm/4h |

PHYSICAL DATA

PHYSICAL STATE: Gas and liquid under pressure

APPEARANCE: Colorless gas with

ODOR: Pungent odor

ODOR THRESHOLD: Unknown

SPECIFIC GRAVITY (H₂O = 1): See Vapor Density (air = 1)

VAPOR PRESSURE: 720 kPa @ 15°C

VAPOR DENSITY (air = 1): 0.590

EVAPORATION RATE: Not applicable (gas)

BOILING POINT: -33.41°C

FREEZING POINT: -77.74°C

pH: Basic when in solution

GAS DENSITY: 0.714 kg/m³ @ 15°C, 101.3 kPa

COEFFICIENT OF WATER/OIL DISTRIBUTION: Very soluble in water liberating heat

FIRE OR EXPLOSION HAZARD

| | |
|--|--|
| CONDITIONS OF FLAMMABILITY: | Flammable in air over a relatively narrow range. |
| MEANS OF EXTINCTION: | Water, and since ammonia is soluble in water it is the best extinguishing media...not only extinguishing the fire, but absorbing the ammonia. "Stop flow of gas before extinguishing fire". |
| FLASHPOINT AND METHOD OF DETERMINATION: | Not applicable (gas) |
| UPPER EXPLOSION LIMIT (% BY VOL): | 27 |
| LOWER EXPLOSION LIMIT (% BY VOL): | 15 |
| AUTO-IGNITION TEMPERATURE: | The minimum ignition energy for ammonia is very high. It is approximately 500 times greater than the energy required for igniting hydrocarbons and 1000 to 10,000 times greater than that required for hydrogen. |
| FLAMMABILITY CLASSIFICATION: | Class 1, Group D |
| HAZARDOUS COMBUSTION PRODUCTS: | None |
| EXPLOSION DATA: | Reacts vigorously with strong oxidizers (F ₂ , Cl ₂ , HBr, etc.) |
| SENSITIVITY TO STATIC DISCHARGE: | See Auto Ignition Temperature, above. |

REACTIVITY DATA

CHEMICAL STABILITY: Highly associated and stable.

INCOMPATIBLE MATERIALS: Strong oxidizers (see above)

CONDITIONS OF REACTIVITY: Dissociation begins to occur at 449°C and at atmospheric pressure yielding N₂ + H₂

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen at very high (greater than 449°C) temperatures.

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: Mild concentrations of vapor will cause dermatitis or conjunctivitis. Higher concentrations of vapor or liquid contact will cause caustic-like dermal burns and inflammation and swelling of the eyes with possible loss of vision. Rapidly evaporating liquid contacting dermal tissue or the eyes will cause cryogenic "burns".

SKIN ABSORPTION: None

EYE: See Skin Contact, above.

INHALATION: Corrosive and irritating to the upper respiratory system and all mucosal tissue. Depending on the concentration inhaled, it may cause burning sensations, coughing, wheezing, shortness of breath, headache, nausea, with eventual collapse.

INGESTION: None

ACUTE OVER EXPOSURE EFFECTS: Inhalation: Affects the upper airways (larynx and bronchi) by causing caustic-like burning resulting in edema and chemical pneumonitis. If it enters the deep lung, pulmonary edema will result. Toxic level exposure to dermal tissue causes caustic-like burns and skin lesions resulting in early necrosis and scarring. Burns to the eye result in lesions and possible loss of vision. Cryogenic "burns" are like frostbite with a change in skin color to gray or white possibly followed by blistering.

CHRONIC OVER EXPOSURE EFFECTS: None known

EXPOSURE LIMITS: TWA = 25 molar ppm; STEL = 35 molar ppm (ACGIH 1995-1996)

IRRITANCY OF PRODUCT: Yes, see Skin and Eyes, above.

SENSITIZATION TO MATERIAL: None known

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None known

TERATOGENICITY, MUTAGENICITY: None known

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Plastic or rubber gloves. Safety goggles or glasses. Safety shoes, safety shower and eyewash "fountain".

SPECIFIC ENGINEERING CONTROLS: Gaseous or liquid anhydrous ammonia corrodes certain metals at ambient temperatures. Oxygen presence enhances the corrosion of ordinary or semi-alloy steels. The addition of water inhibits this enhancement. Refer to Liquid Air gas Encyclopedia for a complete discussion.

Keep anhydrous ammonia systems scrupulously dry.

LEAK AND SPILL PROCEDURES: EVACUATE ALL PERSONNEL FROM AFFECTED AREA.

Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact the closest MEGS location.

WASTE DISPOSAL: Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to MEGS for proper disposal. For emergency disposal, contact the closest MEGS location.

HANDLING PROCEDURES AND EQUIPMENT: USE ONLY IN WELL-VENTILATED AREAS.

Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Do not tamper with (valve) safety device. Close valve after each use and when empty.

STORAGE REQUIREMENTS: Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders from being stored for excessive periods for time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

TDG CLASSIFICATION: 2.4 (9.2)

WHMIS CLASSIFICATION: A, DI, E

SPECIAL SHIPPING INFORMATION: Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

FIRST AID MEASURES

SPECIFIC FIRST AID PROCEDURES: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO AMMONIA. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

INHALATION: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Unconscious persons should be moved to an uncontaminated area and given assisted respiration and supplemental oxygen. Keep the victim warm and quiet. Assure that mucus or vomited material does not obstruct the airway by positional drainage.

EYE CONTACT: PERSONS WITH POTENTIAL EXPOSURE TO AMMONIA SHOULD NOT WEAR CONTACT LENSES.

Flush contaminated eye(s) with copious quantities of water. Part eyelids to assure complete flushing. Continue for a minimum of 15 minutes.

SKIN CONTACT: Flush affected area with copious quantities of water. Remove affected clothing as rapidly as possible.

Dermal Contact or Frostbite: Remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if the cryogenic "burn" has resulted in blistering of the dermal surface or deep tissue freezing.

PREPARATION INFORMATION

PREPARED BY: Safety Department

DATE PREPARED: 09/01/1999

LAST REVISION DATE: 10/01/2008

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