

Material Safety Data Sheet

Ammonia

Section 1. Chemical product and company identification

Product name : Ammonia
Supplier :

Product use : Synthetic/Analytical chemistry.
Synonym : ammonia
MSDS # : 001003
Date of Preparation/Revision : 5/11/2011.
In case of emergency :

Section 2. Hazards identification

Physical state : Gas. [COLORLESS GAS OR COLD, MOBILE LIQUID WITH A STRONG, PENETRATING ODOR]
DANGER!
CAUSES SEVERE RESPIRATORY TRACT, EYE AND SKIN BURNS.
MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
CONTENTS UNDER PRESSURE.
Do not puncture or incinerate container. Do not breathe gas. Do not get on skin or clothing. May cause target organ damage, based on animal data. Use only with adequate ventilation. Keep container closed. Do not get in eyes, on skin or on clothing. Avoid breathing gas. Wash thoroughly after handling.
Contact with rapidly expanding gases can cause frostbite.

Target organs : May cause damage to the following organs: lungs, upper respiratory tract, skin, eyes.
Routes of entry : Inhalation Dermal Eyes

Potential acute health effects

Eyes : Severely corrosive to the eyes. Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.
Skin : Severely corrosive to the skin. Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation : Severely corrosive to the respiratory system.
Ingestion : Ingestion is not a normal route of exposure for gases

Potential chronic health effects

Chronic effects : May cause target organ damage, based on animal data.
Target organs : May cause damage to the following organs: lungs, upper respiratory tract, skin, eyes.

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

Section 3. Composition, Information on Ingredients

| <u>Name</u> | <u>CAS number</u> | <u>% Volume</u> | <u>Exposure limits</u> |
|-------------|-------------------|-----------------|---|
| Ammonia | 7664-41-7 | 100 | <p>ACGIH TLV (United States, 2/2010). STEL: 24 mg/m³ 15 minute(s). STEL: 35 ppm 15 minute(s). TWA: 17 mg/m³ 8 hour(s). TWA: 25 ppm 8 hour(s).</p> <p>NIOSH REL (United States, 6/2009). STEL: 27 mg/m³ 15 minute(s). STEL: 35 ppm 15 minute(s). TWA: 18 mg/m³ 10 hour(s). TWA: 25 ppm 10 hour(s).</p> <p>OSHA PEL (United States, 11/2006). TWA: 35 mg/m³ 8 hour(s). TWA: 50 ppm 8 hour(s).</p> <p>OSHA PEL 1989 (United States, 3/1989). STEL: 27 mg/m³ 15 minute(s). STEL: 35 ppm 15 minute(s).</p> |

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

| | |
|---------------------|--|
| Eye contact | : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately. |
| Skin contact | : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately. |
| Frostbite | : Try to warm up the frozen tissues and seek medical attention. |
| Inhalation | : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately. |
| Ingestion | : As this product is a gas, refer to the inhalation section. |

Section 5. Fire-fighting measures

| | |
|---|--|
| Flammability of the product | : Non-flammable. |
| Auto-ignition temperature | : 651.11 C (1204 F) |
| Flammable limits | : Lower: 15% Upper: 28% |
| Products of combustion | : Decomposition products may include the following materials: nitrogen oxides |
| Fire hazards in the presence of various substances | : Extremely flammable in the presence of the following materials or conditions: oxidizing materials. |
| Fire-fighting media and instructions | : Use an extinguishing agent suitable for the surrounding fire. |
| Special protective equipment for fire-fighters | <p>Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.</p> <p>Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.</p> <p>: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</p> |

Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : Immediately contact emergency personnel. Stop leak if without risk. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : Use only with adequate ventilation. Wash thoroughly after handling. High pressure gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Do not get in eyes, on skin or on clothing. Keep container closed. Do not get on skin or clothing. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Storage** : Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

- Engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protection

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Personal protection in case of a large spill** : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Full chemical-resistant suit and self-contained breathing apparatus should be worn only by trained and authorized persons.

Product name

Ammonia, anhydrous

ACGIH TLV (United States, 2/2010).

STEL: 24 mg/m³ 15 minute(s).
STEL: 35 ppm 15 minute(s).
TWA: 17 mg/m³ 8 hour(s).
TWA: 25 ppm 8 hour(s).

NIOSH REL (United States, 6/2009).

STEL: 27 mg/m³ 15 minute(s).
STEL: 35 ppm 15 minute(s).
TWA: 18 mg/m³ 10 hour(s).
TWA: 25 ppm 10 hour(s).

OSHA PEL (United States, 11/2006).

TWA: 35 mg/m³ 8 hour(s).
TWA: 50 ppm 8 hour(s).

OSHA PEL 1989 (United States, 3/1989).

STEL: 27 mg/m³ 15 minute(s).

STEL: 35 ppm 15 minute(s).

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

| | |
|--|--|
| Molecular weight | : 17.04 g/mole |
| Molecular formula | : H ₃ -N |
| Boiling/condensation point | : -33.3 C (-27.9 F) |
| Melting/freezing point | : -77.8 C (-108 F) |
| Critical temperature | : 132.4 C (270.3 F) |
| Vapor density | : 0.6 (Air = 1) |
| Specific Volume (ft³/lb) | : 22.7273 |
| Gas Density (lb/ft³) | : 0.044 |
| Physical/chemical properties comments | : SPECIFIC GRAVITY (AIR=1): @ 70 F (21.1 C) = 0.59 PH: Approx. 11.6 for 1 N Sol'n. in water |

Section 10. Stability and reactivity

| | |
|--|--|
| Stability and reactivity | : The product is stable. |
| Incompatibility with various substances | : Extremely reactive or incompatible with the following materials: oxidizing materials. |
| Hazardous decomposition products | : Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| Hazardous polymerization | : Under normal conditions of storage and use, hazardous polymerization will not occur. |

Section 11. Toxicological information

Toxicity data

| Product/ingredient name | Result | Species | Dose | Exposure |
|-------------------------|-----------------------|---------|-------------------------|------------|
| Ammonia, anhydrous | LC50 Inhalation Vapor | Rat | 18600 mg/m ³ | 5 minutes |
| | LC50 Inhalation Vapor | Rat | 7040 mg/m ³ | 30 minutes |
| | LC50 Inhalation Gas. | Rat | 17401 ppm | 15 minutes |
| | LC50 Inhalation Gas. | Rat | 9500 ppm | 1 hours |
| | LC50 Inhalation Gas. | Rat | 2000 ppm | 4 hours |
| | | | | |

IDLH : 300 ppm

Chronic effects on humans : May cause damage to the following organs: lungs, upper respiratory tract, skin, eyes.

Other toxic effects on humans : Hazardous by the following route of exposure: of skin contact (corrosive), of eye contact (corrosive), of inhalation (lung corrosive).

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

| Product/ingredient name | Test | Result | Species | Exposure |
|-------------------------|------|--------|---------|----------|
|-------------------------|------|--------|---------|----------|

Ammonia

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|--------------------|---|--|---|----------|
| Ammonia, anhydrous | - | Acute LC50 0.88 mg/L Fresh water | Fish - Orangethroat darter - Etheostoma spectabile | 96 hours |
| | - | Acute LC50 0.74 mg/L Fresh water | Fish - Orangethroat darter - Etheostoma spectabile | 96 hours |
| | - | Acute LC50 1 to 1.5 ppm Fresh water | Fish - Fathead minnow - Pimephales promelas - LARVAE - 90 days | 96 hours |
| | - | Acute LC50 0.53 ppm Fresh water | Daphnia - Water flea - Daphnia magna | 48 hours |
| | - | Acute LC50 0.5 to 1 ppm Fresh water | Fish - Fathead minnow - Pimephales promelas - LARVAE - 14 days | 96 hours |
| | - | Acute LC50 31260 ug/L Marine water | Crustaceans - Redtail prawn - Penaeus penicillatus - 3.58 to 4.75 cm - 0.4 to 0.69 g | 48 hours |
| | - | Acute LC50 25400 ug/L Fresh water | Daphnia - Water flea - Daphnia magna | 48 hours |
| | - | Acute LC50 22790 to 32200 ug/L Marine water | Crustaceans - Kuruma shrimp - Penaeus japonicus - Post- larvae | 48 hours |
| | - | Acute LC50 16010 to 21460 ug/L Marine water | Crustaceans - Kuruma shrimp - Penaeus japonicus - Mysis | 48 hours |
| | - | Acute LC50 14860 to 19140 ug/L Marine water | Crustaceans - Redtail prawn - Penaeus penicillatus - Zoea | 48 hours |
| | - | Acute LC50 14530 to 20600 ug/L Marine water | Crustaceans - San paulo shrimp - Penaeus paulensis - Zoea | 48 hours |
| | - | Acute LC50 11310 to 15480 ug/L Marine water | Crustaceans - Kuruma shrimp - Penaeus japonicus - Zoea | 48 hours |
| | - | Acute LC50 8590 to 9640 ug/L Marine water | Crustaceans - San paulo shrimp - Penaeus paulensis - Post- larvae | 48 hours |
| | - | Acute LC50 5210 to 6040 ug/L Marine water | Crustaceans - Redtail prawn - Penaeus | 48 hours |

Ammonia

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|---|---|---|----------|
| | | penicillatus - Zoea | |
| - | Acute LC50 4980 to 9070 ug/L Marine water | Crustaceans - Kuruma shrimp - Penaeus japonicus - Nauplii | 48 hours |
| - | Acute LC50 4180 to 6030 ug/L Fresh water | Daphnia - Water flea - Daphnia magna - <24 hours | 48 hours |
| - | Acute LC50 4130 to 5100 ug/L Fresh water | Daphnia - Water flea - Daphnia pulex - <24 hours | 48 hours |
| - | Acute LC50 2710 to 3670 ug/L Fresh water | Daphnia - Water flea - Ceriodaphnia reticulata - <4 hours | 48 hours |
| - | Acute LC50 2500 ug/L Fresh water | Crustaceans - Aquatic sowbug - Asellus aquaticus - 8 to 10 mm | 48 hours |
| - | Acute LC50 660 ug/L Fresh water | Fish - common carp - Cyprinus carpio | 96 hours |
| - | Acute LC50 450 to 470 ug/L Fresh water | Fish - Chinook salmon - Oncorhynchus tshawytscha - Underyearling - 1 to 7 g | 96 hours |
| - | Acute LC50 440 ug/L Fresh water | Fish - common carp - Cyprinus carpio | 96 hours |
| - | Acute LC50 380 ug/L Fresh water | Fish - Silver carp - Hypophthalmichthys molitrix - Fingerling | 96 hours |
| - | Acute LC50 300 ug/L Fresh water | Fish - Carp - Hypophthalmichthys nobilis | 96 hours |

Products of degradation : Products of degradation: nitrogen oxides (NO, NO₂ etc.).

Environmental fate : Not available.





Environmental hazards : No known significant effects or critical hazards.

Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation .Do not dispose of locally.

Section 14. Transport information

| Regulatory information | UN number | Proper shipping name | Class | Packing group | Label | Additional information |
|------------------------------|-----------|--|-------|-----------------------|--|--|
| DOT Classification | UN1005 | AMMONIA, ANHYDROUS | 2.2 | Not applicable (gas). |  | <p>Reportable quantity 100 lbs. (45.4 kg)</p> <p>Limited quantity Yes.</p> <p>Packaging instruction Passenger aircraft Quantity limitation: Forbidden.</p> <p>Cargo aircraft Quantity limitation: Forbidden.</p> <p>Special provisions 13,T50</p> |
| TDG Classification | UN1005 | AMMONIA, ANHYDROUS; OR ANHYDROUS AMMONIA | 2.3 | Not applicable (gas). |   | <p>Explosive Limit and Limited Quantity Index 0</p> <p>ERAP Index 3000</p> <p>Passenger Carrying Ship Index Forbidden</p> <p>Passenger Carrying Road or Rail Index Forbidden</p> <p>Special provisions</p> |
| Mexico Classification | UN1005 | AMMONIA, ANHYDROUS | 2.2 | Not applicable (gas). |  | - |

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Section 15. Regulatory information

United States

- U.S. Federal regulations** :
- TSCA 8(a) IUR:** Partial exemption
 - United States inventory (TSCA 8b):** This material is listed or exempted.
 - SARA 302/304/311/312 extremely hazardous substances:** Ammonia, anhydrous
 - SARA 302/304 emergency planning and notification:** Ammonia, anhydrous
 - SARA 302/304/311/312 hazardous chemicals:** Ammonia, anhydrous
 - SARA 311/312 MSDS distribution - chemical inventory - hazard identification:** Ammonia, anhydrous: Sudden release of pressure, Immediate (acute) health hazard
 - Clean Water Act (CWA) 311:** Ammonia, anhydrous
 - Clean Air Act (CAA) 112 accidental release prevention - Toxic Substances:** Ammonia
 - Clean Air Act (CAA) 112 regulated toxic substances:** Ammonia, anhydrous

SARA 313

| | <u>Product name</u> | <u>CAS number</u> | <u>Concentration</u> |
|--|---------------------|-------------------|----------------------|
| Form R - Reporting requirements | : Ammonia | 7664-41-7 | 100 |
| Supplier notification | : Ammonia | 7664-41-7 | 100 |

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

- State regulations** :
- Connecticut Carcinogen Reporting:** This material is not listed.
 - Connecticut Hazardous Material Survey:** This material is not listed.
 - Florida substances:** This material is not listed.
 - Illinois Chemical Safety Act:** This material is not listed.
 - Illinois Toxic Substances Disclosure to Employee Act:** This material is not listed.
 - Louisiana Reporting:** This material is not listed.
 - Louisiana Spill:** This material is not listed.
 - Massachusetts Spill:** This material is not listed.
 - Massachusetts Substances:** This material is listed.
 - Michigan Critical Material:** This material is not listed.
 - Minnesota Hazardous Substances:** This material is not listed.
 - New Jersey Hazardous Substances:** This material is listed.
 - New Jersey Spill:** This material is not listed.
 - New Jersey Toxic Catastrophe Prevention Act:** This material is listed.
 - New York Acutely Hazardous Substances:** This material is listed.
 - New York Toxic Chemical Release Reporting:** This material is not listed.
 - Pennsylvania RTK Hazardous Substances:** This material is listed.
 - Rhode Island Hazardous Substances:** This material is not listed.

Canada

- WHMIS (Canada)** :
- Class A: Compressed gas.
 - Class B-1: Flammable gas.
 - Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
 - Class E: Corrosive material
 - CEPA Toxic substances:** This material is not listed.
 - Canadian ARET:** This material is not listed.
 - Canadian NPRI:** This material is listed.
 - Alberta Designated Substances:** This material is not listed.
 - Ontario Designated Substances:** This material is not listed.
 - Quebec Designated Substances:** This material is not listed.

Section 16. Other information

United States

Label requirements : CAUSES SEVERE RESPIRATORY TRACT, EYE AND SKIN BURNS.
MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
CONTENTS UNDER PRESSURE.

Canada

Label requirements : Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class E: Corrosive material

Hazardous Material
Information System (U.S.A.)

| | | |
|------------------|---|---|
| Health | * | 3 |
| Flammability | | 1 |
| Physical hazards | | 0 |
| | | |

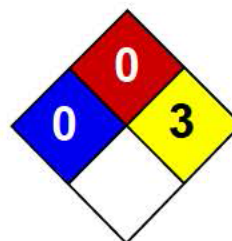
National Fire Protection
Association (U.S.A.)



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



| | |
|---------------------|---|
| Health | 2 |
| Fire | 1 |
| Reactivity | 1 |
| Personal Protection | E |

Material Safety Data Sheet

Ammonium nitrate MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ammonium nitrate

Catalog Codes: SLA3082, SLA4585

CAS#: 6484-52-2

RTECS: BR9050000

TSCA: TSCA 8(b) inventory: Ammonium nitrate

CI#: Not available.

Synonym: Ammonium Saltpeter; Nitric acid, ammonium salt

Chemical Name: Ammonium Nitrate

Chemical Formula: NH₄NO₃

Contact Information:



CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

| Name | CAS # | % by Weight |
|------------------|-----------|-------------|
| Ammonium nitrate | 6484-52-2 | 100 |

Toxicological Data on Ingredients: Ammonium nitrate: ORAL (LD50): Acute: 2217 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (permeator). Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. The substance may be toxic to blood, gastrointestinal tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 300°C (572°F)

Flash Points: CLOSED CUP: Higher than 93.3°C (200°F).

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances:

Slightly flammable to flammable in presence of heat, of combustible materials, of organic materials. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat, of combustible materials, of organic materials, of metals.

Fire Fighting Media and Instructions:

Oxidizing material. Do not use water jet. Use flooding quantities of water. Avoid contact with organic materials.

Special Remarks on Fire Hazards:

Caution: Strong Oxidizer. Contact with material may cause a fire. Contact with combustible or organic materials may cause fire.

Special Remarks on Explosion Hazards:

It is an oxidizing agent and can self-ignite/detonate when in contact with powdered metals and some organic materials such as Urea and Acetic Acid.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:

Oxidizing material. Stop leak if without risk. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal.

Section 7: Handling and Storage

Precautions:

Keep away from heat. Keep away from sources of ignition. Keep away from combustible material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles. See NFPA 43A, Code for the Storage of Liquid and Solid Oxidizers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (white granular solid. Deliquescent solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 80.05 g/mole

Color: Not available.

pH (1% soln/water): 4.5 - 6.0 @ 25 deg. [Acidic.]

Boiling Point: Decomposition temperature: 210°C (410°F)

Melting Point: 169.6°C (337.3°F)

Critical Temperature: Not available.

Specific Gravity: 1.725 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, acetone.

Solubility:

Easily soluble in cold water, hot water. Soluble in acetone. Partially soluble in methanol. Insoluble in diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with reducing agents, combustible materials, organic materials, metals, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Also incompatible with finely powdered metals (aluminum, copper, chromium, iron, zinc brass, nickel, lead, manganese, magnesium, antimony), acetic acid, ammonium chloride, phosphorus, sodium perchlorate, sulfur, bismuth, cadmium, chlorides, cobalt, potassium and ammonium sulfate, sodium, sodium hypochlorite, sodium-potassium alloy, organic materials and combustible materials (paper, oil, charcoal, etc.)

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 2217 mg/kg [Rat].

Chronic Effects on Humans:

Causes damage to the following organs: lungs, mucous membranes. May cause damage to the following organs: blood, gastrointestinal tract.

Other Toxic Effects on Humans:

Hazardous in case of skin contact (irritant), of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

Carcinogenic effects: At this time, no studies were found on the possible carcinogenicity of Ammonium Nitrate in humans or experimental animals. However nitrates can be reduced to nitrites in the body, and the formed nitrites can subsequently react with amines to form suspect carcinogens N-nitrosamines. Genetic Effects: No genetic data was found for ammonium. However, in general, nitrates and nitrites are genotoxic. Reproductive Effects: There has been some association between consumption of nitrate-contaminated well water and birth defects, especially neural tube defects. However, these studies would not specifically implicate Ammonium Nitrate.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes skin irritation. It may be absorbed through intact skin. Eyes: Causes eye irritation. Inhalation: Causes respiratory tract (nose, throat), and mucous membrane irritation. Symptoms may include: coughing, severe lung congestion, difficulty breathing. Inhalation of large amounts may cause systemic acidosis, Methemoglobinemia with symptoms similar to acute ingestion. Ingestion: Gastroenteritis with abdominal pain, nausea, vomiting, diarrhea. Exposure to large amounts may affect behavior/central nervous system, and blood and cause Methemoglobinemia, and systemic

acidosis. Symptoms of Methemoglobinemia include cyanosis (blue lips, eyelids, earlobes, and skin), headache, fatigue, weakness, convulsions, dizziness, loss of coordination, nausea, vomiting, dyspnea, and drowsiness. It may also affect the cardiovascular system and cause increased or decreased heart rate, and hypotension. Chronic Potential Health Effects: Ingestion: The toxicity of nitrates is due to in vivo conversion to nitrites. Chronic ingestion of more than 5 mg/kg/day is considered unacceptable. Primary overdose effects include orthostatic hypotension and Methemoglobinemia. Orthostatic hypotension, faintness, fatigue, weakness, depression, mental impairment, dizziness, shortness of breath, and reflex tachycardia are common; headache, nausea and vomiting may also occur. Chronic ingestion may also cause nephritis.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 5.1: Oxidizing material.

Identification: : Ammonium Nitrate UNNA: 1942 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found. California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found. Connecticut hazardous material survey.: Ammonium nitrate Rhode Island RTK hazardous substances: Ammonium nitrate Pennsylvania RTK: Ammonium nitrate Massachusetts RTK: Ammonium nitrate Massachusetts spill list: Ammonium nitrate New Jersey: Ammonium nitrate New Jersey spill list: Ammonium nitrate TSCA 8(b) inventory: Ammonium nitrate

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS C: Oxidizing material.

DSCL (EEC):

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 1

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 0

Reactivity: 3

Specific hazard:

Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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