Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
<th>Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>See Section 15.</td>
</tr>
</tbody>
</table>

Common Name/Trade Name: Ammonia-Cyanide TS

Manufacturer: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Commercial Name(s): Not available.

Synonym: Not available.

Chemical Name: Not applicable.

Chemical Family: (Alkali.)

Chemical Formula: Not applicable.

Supplier: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Catalog Number(s): A-274

CAS#: Mixture.

RTECS: Not applicable.

TSCA: TSCA 8(b) inventory: Water; Ammonium hydroxide; Potassium cyanide

CI#: Not applicable.

IN CASE OF EMERGENCY
CHEMTREC (24hr) 800-424-9300
CALL (310) 516-8000

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>TWA (mg/m³)</th>
<th>STEL (mg/m³)</th>
<th>CEIL (mg/m³)</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Water</td>
<td>7732-18-5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Ammonia, anhydrous/Ammonium Hydroxide</td>
<td>7664-41-7</td>
<td>50</td>
<td>35</td>
<td>0.7</td>
<td>93.3-94</td>
</tr>
<tr>
<td>3) Potassium cyanide</td>
<td>151-50-8</td>
<td></td>
<td></td>
<td></td>
<td>4.05-4.65/15</td>
</tr>
</tbody>
</table>

Toxicological Data on Ingredients

Ammonia, anhydrous:
GAS (LC50): Acute: 2000 ppm 4 hours [Rat]. 4230 ppm 1 hours [Mouse].

Potassium cyanide:
ORAL (LD50): Acute: 5 mg/kg [Rabbit]. 8.5 mg/kg [Mouse]. 5 mg/kg [Rat].

Section 3. Hazards Identification

Potential Acute Health Effects: Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion. Hazardous in case of skin contact (permeator), Slightly hazardous in case of skin contact (corrosive), of eye contact (corrosive). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Continued on Next Page
**Potential Chronic Health Effects**

**CARCINOGENIC EFFECTS:** Not available.

**MUTAGENIC EFFECTS:** Mutagenic for bacteria and/or yeast. [Ammonia, anhydrous]. Mutagenic for mammalian somatic cells. [Potassium cyanide].

**TERATOGENIC EFFECTS:** Not available.

**DEVELOPMENTAL TOXICITY:** Not available.

The substance is toxic to blood, liver.

The substance may be toxic to lungs, mucous membranes, cardiovascular system, upper respiratory tract, skin, eyes, central nervous system (CNS).

Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

---

**Section 4. First Aid Measures**

**Eye Contact**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention immediately. Finish by rinsing thoroughly with running water to avoid a possible infection.

**Skin Contact**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Serious Skin Contact**

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

**Inhalation**

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

**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. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion**

If swallowed, 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 immediately.

**Serious Ingestion**

Not available.

---

**Section 5. Fire and Explosion Data**

**Flammability of the Product**

Non-flammable.

**Auto-Ignition Temperature**

Not applicable.

**Flash Points**

Not applicable.

**Flammable Limits**

Not applicable.

**Products of Combustion**

Not available.

**Fire Hazards in Presence of Various Substances**

Not applicable.

**Explosion Hazards in Presence of Various Substances**

Non-explosive in presence of open flames and sparks, of shocks.

**Fire Fighting Media and Instructions**

Not applicable.

**Special Remarks on Fire Hazards**

Not available.

---

*Continued on Next Page*
A sudden increase in temperature and pressure preceded a violent explosion when heating 1-chloro-2,4-dinitrobenzene and ammonia in a direct fired autoclave. Reaction with liquid ammonia and chlorine azide gives an explosive yellow liquid. Liquid ammonia + 1,2 dichloroethane may explode. Passing ammonia gas over magnesium perchlorate dessicant causes intensive drying of ammonia gas which leads to an exotherm, followed by a violent explosion. Ammonia is capable of reacting with some heavy metal compounds (gold, silver, mercury) to produce materials, some of uncertain constitution, which may explode violently when dry. Action of ammonia or ammonium salts on gold (III) chloride, oxide or other salts under a variety of conditions gives explosive or “fulminating” gold.

Halogens or interhalogens + ammonia either react violently or produce explosive products. Ammonia + nitrogen trichloride produces endothermic and explosive nitrogen trichloride. Reaction of ammonia + selenium difluoride dioxide is violent and many of the products and derivatives are both shock and heat sensitive explosives. These include ammonium, potassium silver and thallium salts of the “triselenimidate” ion.

Violent explosions with ammonia + nitrogen oxide can occur in ammonia synthesis gas units. Liquid ammonia + solid dinitrogen tetraoxide reacts explosively. Oxygen + Platinium: oxidation of ammonia to nitric acid over platinium catalysts, substitution of oxygen for air causes fairly vigorous explosions. Thiocarbonyl azid thiocyanate reacts explosively with ammonia gas. Thiotrithiazyl chloride will rapidly absorb ammonia gas and then explode. Tetramethylammonium amide decomposes explosively in presence of ammonia. Liquid ammonia + tellurium tetrachloride at -15 C forms tellurium nitride which explodes at 200 C.

Ammonia + tellurium tetrabromide gives a mixture of trtellurium tetramitride and tellurium bromide nitride, which explodes on heating. Liquid ammonia + ethylene oxide causes violent polymerization and a vapor cloud explosion. Ammonia + picric acid forms explosive salts.

(Ammonia, anhydrous)

**Section 6. Accidental Release Measures**

**Small Spill**
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: **Neutralize the residue with a dilute solution of acetic acid.**

**Large Spill**
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. **Neutralize the residue with a dilute solution of acetic acid.** Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

**Section 7. Handling and Storage**

**Precautions**
Keep locked up. Keep container dry. Do not ingest. Do not breathe gas/fumes/vapor/spray. Never add water to this product. 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.

**Section 8. Exposure Controls/Personal Protection**

**Engineering Controls**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection**

**Personal Protection in Case of a Large Spill**
Splash goggles. Full suit. Vapor 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**

*Continued on Next Page*
**Ammonia-Cyanide TS**

**Ammonia, anhydrous**
- **TWA:** 17 STEL: 24 (mg/m\(^3\)) from ACGIH (TLV) [United States] Inhalation
- **TWA:** 25 STEL: 35 (ppm) from ACGIH (TLV) [USA] Inhalation
- **TWA:** 50 (ppm) from OSHA (PEL) [USA] Inhalation
- **TWA:** 35 (mg/m\(^3\)) from OSHA (PEL) [USA] Inhalation
- **TWA:** 25 STEL: 35 (ppm) [United Kingdom (UK)] Inhalation
- **TWA:** 18 STEL: 15 (mg/m\(^3\)) [United Kingdom (UK)] Inhalation

**Potassium cyanide**
- **STEL:** 5 (mg/m\(^3\)) from ACGIH (TLV) [United States]
- **CEIL:** 0.7 from NIOSH [United States]
- **CEIL:** 5 (mg/m\(^3\)) from NIOSH [United States]

Consult local authorities for acceptable exposure limits.

---

**Section 9. Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Physical state and appearance</th>
<th>Liquid.</th>
<th>Odor</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Weight</td>
<td>Not applicable.</td>
<td>Taste</td>
<td>Not available.</td>
</tr>
<tr>
<td>pH (1% soln/water)</td>
<td>Basic.</td>
<td>Color</td>
<td>Clear Colorless.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>The lowest known value is 100°C (212°F) (Water).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>Not available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Weighted average: 0.99 (Water = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>The highest known value is 2.3 kPa (@ 20°C) (Water).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor Density</td>
<td>The highest known value is 0.62 (Air = 1) (Water).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volatility</td>
<td>Not available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ionicity (in Water)</td>
<td>Not available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispersion Properties</td>
<td>See solubility in water, methanol, diethyl ether.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solubility</td>
<td>Easily soluble in cold water, hot water. Soluble in methanol, diethyl ether.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Section 10. Stability and Reactivity Data**

<table>
<thead>
<tr>
<th>Stability</th>
<th>The product is stable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Conditions of Instability</td>
<td>Incompatible materials</td>
</tr>
<tr>
<td>Incompatibility with various substances</td>
<td>Slightly reactive to reactive with oxidizing agents, metals, acids.</td>
</tr>
<tr>
<td>Corrosivity</td>
<td>Non-corrosive in presence of glass.</td>
</tr>
</tbody>
</table>

**Special Remarks on Reactivity**

Halogens, salts of silver and zinc, air and hydrocarbons, calcium, 1-chloro-2,4-dinitrobenzene, chloroformaminidium nitrate, 2-chloronitrobenzene, chlorine azide, magnesium perchlorate, halogens or interhalogens, iodine, potassium, nitrogen trichloride, potassium chloride, nitryl chloride, chromyl chloride, chromium trioxide, trioxogen difluoride, selenium difluoride dioxide, nitric acid, hydrogen peroxide, nitrogen oxide, dinitrogen tetraxide, oxygen, platinum, silver chloride, thiocarbonyl azide thiocyanate, sulfuryl chloride, thiocyanuric chloride, tetramethylammonium amide, tellurium tetrachloride, tellurium tetrabromide, silver (I) oxide, dichlorine oxide, silver nitrate, ethylene oxide, acetaldehyde, acrolein, boron boron trioxide, bromine, bromine pentfluoride, fluorine, chloric acid, chlorine monoxide, chlorine trifluoride, chlorites, chlorosilane, chromic anhydride, ethylene dichloride, hydrogen bromide, hypochlorous acid, nitrogen peroxide, fluorine, some heavy metals (gold, silver, mercury), hexachloromelamine, hydrazine, alkali metals, nitrogen trifluoride, oxygen difluoride.
**Section 11. Toxicological Information**

<table>
<thead>
<tr>
<th>Routes of Entry</th>
<th>Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to Animals</td>
<td>Acute oral toxicity (LD50): 5 mg/kg [Rat]. (Potassium cyanide) Acute oral toxicity (LD50): 350 mg/kg [Rat]. (Ammonium Hydroxide).</td>
</tr>
<tr>
<td>Chronic Effects on Humans</td>
<td>MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. [Ammonia, anhydrous]. Mutagenic for mammalian somatic cells. [Potassium cyanide]. Contains material which may cause damage to the following organs: lungs, mucous membranes, cardiovascular system, upper respiratory tract, skin, eyes, central nervous system (CNS).</td>
</tr>
<tr>
<td>Other Toxic Effects on Humans</td>
<td>Very hazardous in case of skin contact (irritant), of ingestion. Hazardous in case of skin contact (permeator), of inhalation (lung corrosive). Slightly hazardous in case of skin contact (corrosive), of eye contact (corrosive).</td>
</tr>
<tr>
<td>Special Remarks on Toxicity to Animals</td>
<td>Lowest Published Lethal Dose LCL [Human] - Route: Inhalation; Dose: 5000 ppm/5M (Ammonia, anhydrous)</td>
</tr>
<tr>
<td>Special Remarks on Chronic Effects on Humans</td>
<td>May affect genetic material based on tests with microorganisms and animals. May cause cancer (tumorigenic) based on animal data. No human data found at this time. (Ammonia, anhydrous)</td>
</tr>
<tr>
<td>Special Remarks on other Toxic Effects on Humans</td>
<td>Acute Potential Health Effects: Skin: Causes severe irritation and burns. May cause deep, penetrating ulcers of the skin. Contact with skin may cause staining, inflammation, and thickening of the skin. Eyes: Causes severe irritation and burns. May cause irreversible eye damage including corneal injury and cataracts. Inhalation: Causes severe irritation of the upper respiratory tract with coughing, burns, breathing difficulty. May cause acute pulmonary edema, pneumonia, fibrosis, and even coma. This product contains approximately 15% Ammonium Hydroxide. Ammonium Hydroxide is it is a respiratory stimulant when inhaled at lower concentrations. It may also affect behavior/central nervous system (convulsions, seizures, ataxia, tremor), cardiovascular system (increase in blood pressure and pulse rate). Inhalation of high concentrations may cause central nervous system effects similar to those described for ingestion. Ingestion: Harmful if swallowed. This product contains approximately 15% Ammonium Hydroxide which causes severe irritation and burns of the digestive/gastrointestinal tract (lips, mouth, larynx, throat), throat constriction, nausea, vomiting, convulsions. May also cause severe and permanent damage of the digestive/gastrointestinal tract and affect the liver, and urinary system (kidneys), behavior/central nervous system (convulsions, seizures, ataxia, excitement). This product also contains Potassium Cyanide. The ingestion of Potassium Cyanide may cause tissue anoxia. It may also affect behavior/Central Nervous system, metabolism, cardiovascular system, respiratory system, blood, respiration. Symptoms of cyanide poisoning may include flushing, nausea, vomiting, palpitations, tachycardia, hypotension, hypertension, increased pulse rate, arrhythmias, heart conduction defects, hyperpnea, headache, dizziness, confusion, anxiety, agitation, tremors, weakness, hyperventilation, dyspnea, apnea, severe hypoxic signs in absence of cyanosis (cyanosis is generally late finding), convulsions, seizures, memory loss, insomnia, metabolic acidosis, poor appetite. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may cause dermatitis. Eye: May cause corneal damage and the development of cataracts and glaucoma. Ingestion: Prolonged or repeated exposure from ingestion may affect the urinary system, brain, liver and thyroid (goiter) as well have the same effects as acute overexposure. Inhalation: Repeated exposure to low concentrations may cause bronchitis with cough, phlegm, and/or shortness of breath. May also cause liver and kidney damage, and affect the brain, and blood.</td>
</tr>
</tbody>
</table>
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 products of degradation are less toxic than the product itself.

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 8: Corrosive material
CLASS 6.1: Poisonous material.

Identification : Corrosive Liquid, toxic, n.o.s (Potassium cyanide) UNNA: 2922 PG: III

Special Provisions for Transport Marine Pollutant (Potassium cyanide)

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations

Connecticut hazardous material survey.: Ammonium hydroxide; Potassium cyanide
Illinois toxic substances disclosure to employee act: Ammonium hydroxide
Illinois chemical safety act: Ammonium hydroxide; Potassium cyanide
New York release reporting list: Ammonium hydroxide
New York acutely hazardous substances: Potassium cyanide
Rhode Island RTK hazardous substances: Potassium cyanide
Pennsylvania RTK: Ammonium hydroxide; Potassium cyanide
Minnesota: Potassium cyanide
Massachusetts RTK: Ammonium hydroxide; Potassium cyanide
Massachusetts spill list: Ammonium hydroxide; Potassium cyanide
New Jersey: Ammonium hydroxide; Potassium cyanide
New Jersey spill list: Ammonium hydroxide; Potassium cyanide
New Jersey toxic catastrophe prevention act: Ammonium hydroxide
Louisiana RTK reporting list: Potassium cyanide
Louisiana spill reporting: Ammonium hydroxide; Potassium cyanide
California Director's List of Hazardous Substances: Potassium cyanide; Ammonium Hydroxide
TSCA 8(b) inventory: Water; Ammonium hydroxide; Potassium cyanide
SARA 302/304/311/312 extremely hazardous substances: Potassium cyanide
CERCLA: Hazardous substances.: Ammonium hydroxide: 1000 lbs. (453.6 kg); Potassium cyanide: 10 lbs. (4.536 kg);

California Proposition 65 Warnings

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.

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.

CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).

CLASS E: Corrosive liquid.

R25- Toxic if swallowed.
R34- Causes burns.

S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39- Wear suitable gloves and eye/face protection.
S38- In case of insufficient ventilation, wear suitable respiratory equipment.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Protective Equipment

Gloves.

Full suit.

Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Face shield.
## Section 16. Other Information

<table>
<thead>
<tr>
<th>MSDS Code</th>
<th>A274S</th>
</tr>
</thead>
<tbody>
<tr>
<td>References</td>
<td>Not available.</td>
</tr>
<tr>
<td>Other Special Considerations</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Validated by Sonia Owen on 4/30/2007.  
Verified by Sonia Owen.  

**CALL (310) 516-8000**

**Notice to Reader**

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user’s responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.