SECTION 1: IDENTIFICATION

Product Identifier
Product Form: Mixture
Product Name: Liquid Ammonium Sulfate

Intended Use of the Product
Municipal and industrial water and wastewater treatment for disinfection as a source of ammonia in chloramination. Disinfection byproduct control.

Name, Address, and Telephone of the Responsible Party
Manufacturer
CHEMTRADE LOGISTICS INC.
155 Gordon Baker Road
Suite 300
Toronto, Ontario M2H 3N5
For SDS Info: (416) 496-5856
www.chemtradelogistics.com

Emergency Telephone Number
Emergency number : Canada: CANUTEC +1-613-996-6666 / US: CHEMTREC +1-800-424-9300
Chemtrade Emergency Contact: (866) 416-4404
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture
Aquatic Acute 2 H401

Label Elements
GHS-US Labeling
: No labeling applicable
Signal Word (GHS-US) : H401 - Toxic to aquatic life
Hazard Statements (GHS-US)
Precautionary Statements (GHS-US) : P273 - Avoid release to the environment
P501 - Dispose of contents/container according to local, regional, territorial, provincial, national, and international regulations.

Other Hazards
Other Hazards Not Contributing to the Classification: Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.
Unknown Acute Toxicity (GHS-US) Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Identifier</th>
<th>% (w/w)</th>
<th>Classification (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium sulfate</td>
<td>(CAS No) 7783-20-2</td>
<td>38 - 40</td>
<td>Aquatic Acute 2, H401</td>
</tr>
<tr>
<td>Citric acid</td>
<td>(CAS No) 77-92-9</td>
<td>0.04</td>
<td>Comb. Dust</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. 2A, H319</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

Description of First Aid Measures
General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).
Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.
Skin Contact: Rinse immediately with plenty of water. Obtain medical attention if irritation develops or persists.
Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

**Most Important Symptoms and Effects Both Acute and Delayed**

**General**: Not expected to present a significant hazard under anticipated conditions of normal use.

**Inhalation**: May cause respiratory irritation. Inhalation of decomposition products may cause pulmonary edema. Symptoms of respiratory complications may occur several hours after.

**Skin Contact**: May cause skin irritation.

**Eye Contact**: May cause eye irritation.

**Ingestion**: Ingestion is likely to be harmful or have adverse effects.

**Chronic Symptoms**: None expected under normal conditions of use.

If you feel unwell, seek medical advice (show the label where possible).

**SECTION 5: FIRE-FIGHTING MEASURES**

**Extinguishing Media**

**Suitable Extinguishing Media**: Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media**: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

**Special Hazards Arising From the Substance or Mixture**

**Fire Hazard**: Not flammable.

**Explosion Hazard**: Product is not explosive.

**Reactivity**: Hazardous reactions will not occur under normal conditions.

**Advice for Firefighters**

**Precautionary Measures Fire**: Exercise caution when fighting any chemical fire.

**Firefighting Instructions**: Use water spray or fog for cooling exposed containers.

**Protection During Firefighting**: Do not enter fire area without proper protective equipment, including respiratory protection.

**Hazardous Combustion Products**: Ammonia.

**Reference to Other Sections**

Refer to section 9 for flammability properties.

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

**Personal Precautions, Protective Equipment and Emergency Procedures**

**General Measures**: Avoid all contact with skin, eyes, or clothing. Avoid breathing vapor, mist, or spray.

**For Non-Emergency Personnel**

**Protective Equipment**: Use appropriate personal protection equipment (PPE).

**Emergency Procedures**: Evacuate unnecessary personnel.

**For Emergency Personnel**

**Protective Equipment**: Equip cleanup crew with proper protection.

**Emergency Procedures**: Ventilate area.

**Environmental Precautions**

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

**Methods and Material for Containment and Cleaning Up**

**For Containment**: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up**: Clear up spills immediately and dispose of waste safely. Spills should be contained with mechanical barriers. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

**Reference to Other Sections**

See Heading 8. Exposure controls and personal protection. Concerning disposal elimination after cleaning, see item 13.

**SECTION 7: HANDLING AND STORAGE**

**Precautions for Safe Handling**

**Hygiene Measures**: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.
Liquid Ammonium Sulfate

Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**Conditions for Safe Storage, Including Any Incompatibilities**

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.


**Specific End Use(s)**
Municipal and industrial water and wastewater treatment for disinfection as a source of ammonia in chloramination. Disinfection byproduct control.

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Control Parameters**
No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

**Exposure Controls**

**Appropriate Engineering Controls:** Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

**Personal Protective Equipment:** Protective goggles. Gloves. Protective clothing. Insufficient ventilation: wear respiratory protection.

**Materials for Protective Clothing:** Chemically resistant materials and fabrics.

**Hand Protection:** Wear chemically resistant protective gloves.

**Eye Protection:** Chemical goggles or safety glasses.

**Skin and Body Protection:** Wear suitable protective clothing.

**Respiratory Protection:** If exposure limits are exceeded or irritation is experienced, NIOSH-approved respiratory protection should be worn.

**Environmental Exposure Controls:** Do not allow the product to be released into the environment.

**Consumer Exposure Controls:** Do not eat, drink or smoke during use.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

**Information on Basic Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear, faint yellow to amber colored</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>pH</td>
<td>3 - 5</td>
</tr>
<tr>
<td>Relative Evaporation Rate (butylacetate=1)</td>
<td>Not available</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>-12 °C (10.4 °F)</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Auto-ignition Temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Ammonium sulfate: 235 °C (455 °F)</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Lower Flammable Limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper Flammable Limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Vapor Density at 20 °C</td>
<td>Not available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.216 - 1.228</td>
</tr>
<tr>
<td>Solubility</td>
<td>Not available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Explosion Data – Sensitivity to Mechanical Impact</td>
<td>Not expected to present an explosion hazard due to mechanical impact.</td>
</tr>
<tr>
<td>Explosion Data – Sensitivity to Static Discharge</td>
<td>Not expected to present an explosion hazard due to static discharge.</td>
</tr>
</tbody>
</table>
**SECTION 10: STABILITY AND REACTIVITY**

**Reactivity:** Hazardous reactions will not occur under normal conditions.

**Chemical Stability:** Stable under recommended handling and storage conditions (see section 7).

** Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.

**Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials.


**Hazardous Decomposition Products:** Ammonia. Sulfur oxides.

---

**SECTION 11: TOXICOLOGICAL INFORMATION**

**Information on Toxicological Effects - Product**

**Acute Toxicity:** Not classified

**LD50 and LC50 Data:** Not available

**Skin Corrosion/Irritation:** Not classified (pH: 3 - 5)

**Serious Eye Damage/Irritation:** Not classified (pH: 3 - 5)

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** May cause respiratory irritation. Inhalation of decomposition products may cause pulmonary edema. Symptoms of respiratory complications may occur several hours after.

**Symptoms/Injuries After Skin Contact:** May cause skin irritation.

**Symptoms/Injuries After Eye Contact:** May cause eye irritation.

**Symptoms/Injuries After Ingestion:** Ingestion is likely to be harmful or have adverse effects.

**Chronic Symptoms:** None expected under normal conditions of use.

**Information on Toxicological Effects - Ingredient(s)**

**LD50 and LC50 Data:**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>LD50 Oral Rat</th>
<th>LD50 Dermal Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium sulfate (7783-20-2)</td>
<td>&gt; 2000 mg/kg</td>
<td></td>
</tr>
<tr>
<td>Citric acid (77-92-9)</td>
<td>5400 mg/kg</td>
<td>&gt; 2000 mg/kg</td>
</tr>
</tbody>
</table>

---

**SECTION 12: ECOLOGICAL INFORMATION**

**Toxicity**

**Ecology - General:** This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

**Ecology - Water:** Toxic to aquatic life.

- **Ammonium sulfate (7783-20-2)**
  - LC50 Fish 1: 5.2 (5.2 - 8.2) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
  - EC50 Daphnia 1: 14 mg/l (Exposure time: 48 h - Species: Daphnia magna)
  - LC 50 Fish 2: 32.2 (32.2 - 41.9) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])

- **Citric acid (77-92-9)**
  - LC50 Fish 1: 1516 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

**Persistence and Degradability**

- **Citric acid (77-92-9)**
  - Persistence and Degradability: Readily biodegradable in water.
Bioaccumulative Potential

<table>
<thead>
<tr>
<th>Substance</th>
<th>Log Pow</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium sulfate (7783-20-2)</td>
<td>-5.1</td>
<td>25 °C</td>
</tr>
<tr>
<td>Citric acid (77-92-9)</td>
<td>-1.72</td>
<td>20 °C</td>
</tr>
</tbody>
</table>

Mobility in Soil: Not available

Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.


SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT: Not regulated for transport
14.2 In Accordance with IMDG: Not regulated for transport
14.3 In Accordance with IATA: Not regulated for transport
14.4 In Accordance with TDG: Not regulated for transport

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

<table>
<thead>
<tr>
<th>Substance</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium sulfate (7783-20-2)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
<tr>
<td>Citric acid (77-92-9)</td>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>

US State Regulations

<table>
<thead>
<tr>
<th>Substance</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium sulfate (7783-20-2)</td>
<td>U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List</td>
</tr>
<tr>
<td></td>
<td>U.S. - Pennsylvania - RTK (Right to Know) List</td>
</tr>
</tbody>
</table>

Canadian Regulations

Liquid Ammonium Sulfate

<table>
<thead>
<tr>
<th>WHMIS Classification</th>
<th>Uncontrolled product according to WHMIS classification criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium sulfate (7783-20-2)</td>
<td>Listed on the Canadian DSL (Domestic Substances List)</td>
</tr>
<tr>
<td></td>
<td>Listed on the Canadian IDL (Ingredient Disclosure List)</td>
</tr>
<tr>
<td>WHMIS Classification</td>
<td>Uncontrolled product according to WHMIS classification criteria</td>
</tr>
<tr>
<td>Citric acid (77-92-9)</td>
<td>Listed on the Canadian DSL (Domestic Substances List)</td>
</tr>
<tr>
<td></td>
<td>Listed on the Canadian IDL (Ingredient Disclosure List)</td>
</tr>
<tr>
<td>WHMIS Classification</td>
<td>Class D Division 2 Subdivision B - Toxic material causing other toxic effects</td>
</tr>
</tbody>
</table>

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision date: 05/01/15

Other Information: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

| Aquatic Acute 2 | Hazardous to the aquatic environment - Acute Hazard Category 2 |
Liquid Ammonium Sulfate
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>Comb. Dust</th>
<th>Combustible Dust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Irrit. 2A</td>
<td>Serious eye damage/eye irritation Category 2A</td>
</tr>
<tr>
<td>H232</td>
<td>May form combustible dust concentrations in air</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
<tr>
<td>H401</td>
<td>Toxic to aquatic life</td>
</tr>
</tbody>
</table>

Party Responsible for the Preparation of This Document
CHEMTRADE LOGISTICS, INC.
For SDS Info: (416) 496-5856

Handle product with due care and avoid unnecessary contact. This information is supplied under U.S. OSHA’S “Right to Know” (29 CFR 1910.1200) and Canada’s WHMIS regulations. Although certain hazards are described herein, we cannot guarantee these are the only hazards that exist. The information contained herein is based on data available to us and is believed to be true and accurate but it is not offered as a product specification. No warranty, expressed or implied, regarding the accuracy of this data, the hazards connected with the use of the product, or the results to be obtained from the use thereof, is made and Chemtrade and its affiliates assume no responsibility. Chemtrade is a member of the CIAC (Chemistry Industry Association of Canada) and adheres to the codes and principles of Responsible Care™.