1. IDENTIFICATION

Product Identifier: Ammonium Carbonate

Product Code(s): A1069

Synonyms: Crystal Ammonia; Baker’s Ammonia; Salt of Hartshorn

Recommended Use: For manufacturing, industrial, and laboratory use only. Use as a catalyst or as a laboratory solute.

Uses Advised Against: Not for food, drug, or household use.

Supplier: Rocky Mountain Reagents, Inc.
4621 Technology Drive, Golden, CO 80403
Phone: (303) 762-0800 Fax: (303) 762-1240

Emergency Phone Number: For health emergency, call poison control: (800) 222-1222.

2. HAZARDS IDENTIFICATION

Hazard Classifications:
- Acute Toxicity – Oral: Category 4
- Eye Damage/Irritation: Category 2A

Signal Word: WARNING

Hazard Statements:
- Harmful if swallowed.
- Causes serious eye irritation.

Pictograms:

Precautionary Statements:

Prevention:
- Wash thoroughly after handling.
- Do not eat, drink, or smoke when using this product.
- Wear protective gloves, protective clothing, eye protection, and face protection.

Response:
- If swallowed: Call a poison center or doctor if you feel unwell. Rinse mouth.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage: Not applicable.

Disposal: Dispose of contents and container in accordance with local, regional, national, and international regulations.

Hazards Not Otherwise Classified: Harmful to aquatic life. Avoid release to the environment.

Toxicity Statement: Not applicable.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Common Name / Synonyms</th>
<th>CAS#</th>
<th>Chemical Formula</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Carbamate</td>
<td>Ammonium Aminoformate</td>
<td>1111-78-0</td>
<td>NH₂COONH₄</td>
<td>50.0</td>
</tr>
<tr>
<td>Ammonium Bicarbonate</td>
<td>Ammonium Hydrogen Carbonate</td>
<td>1066-33-7</td>
<td>NH₄HCO₃</td>
<td>50.0</td>
</tr>
</tbody>
</table>

Trade Secret Statement: Not applicable.

4. FIRST AID MEASURES

First Aid Procedures:

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a physician if symptoms occur.

Ingestion: Rinse mouth. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, keep head low so that vomit does not enter lungs. Never give anything by mouth to an unconscious person. Call a physician or poison control center if symptoms occur.

Skin Contact: Wash skin with soap and plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if symptoms occur.

Eye Contact: Check for and remove contact lenses, if present and easy to do. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician if symptoms occur.

General Advice: Poison information centers in each state can provide additional assistance for scheduled poisons. Ensure that those providing first aid and medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Symptoms and Effects: Irritation, difficulty breathing, coughing, nausea, vomiting, pulmonary edema. Harmful if swallowed. May cause irritation to the eyes, skin, respiratory tract, and gastrointestinal tract. Prolonged or repeated exposure may affect the lungs.

Immediate Medical Care/ Special Treatment: Get medical attention if feeling unwell or concerned. Treat symptomatically.

5. FIREFIGHTING MEASURES

Suitable Extinguishing Media: Water spray, dry powder, alcohol resistant foam, carbon dioxide.
Unsuitable Extinguishing Media: Do not use a solid (straight) water stream, as it may scatter and spread fire.

Hazardous Combustion Products: Nitrogen oxides, carbon oxides, ammonia.

Specific Hazards: Excessive thermal conditions or exposure to incompatible materials (see Section 10) may yield corrosive and/or toxic fumes.

Special Protective Equipment/Precautions for Firefighters: As in any fire, wear MSHA/NIOSH-approved (or equivalent), self-contained, positive-pressure or pressure-demand breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Protective Equipment: Isolate hazard area and keep unnecessary and unprotected personnel away from the area of the leak or spill. Keep upwind. Wear appropriate personal protective equipment (see Section 8). Avoid contact with eyes, skin, and clothing.

Emergency Procedures: In case of chemical emergency, or if unsure how to address an accidental release, consult a professional (see Section 1).

Methods for Containment: Prevent entry into waterways, sewer, basements, or confined areas. Avoid generation of product as dust. Product should not be released to the environment. Contain and recover waste when possible.

Methods for Cleanup: Sweep or collect spill with an inert material (e.g. vermiculite, dry sand, earth, cloth, or fleece) and place in a non-combustible container for reclamation or disposal. Do not flush to sewer. Clean contaminated surface thoroughly. Residues from spills can be diluted with water. Never return spills in original containers for reuse. Clean up in accordance with all applicable regulations.

7. HANDLING AND STORAGE

Handling: Wear personal protective equipment (see Section 8). Use only in well-ventilated areas. Provide sufficient air exchange and/or exhaust in work rooms. Limit exposure to air and moisture. Avoid contact with skin, eyes, and clothing. Avoid generation of dust. Do not breathe product dust. Do not ingest. When using, do not eat, drink, or smoke. Keep away from incompatible materials (see Section 10). Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling. Containers of this material may be hazardous when empty, as they retain product residues. Observe all warnings and precautions listed for this product.

Storage: Store in a cool, dry, ventilated area. Store away from heat and incompatible materials (see Section 10). Store in original container. Keep containers tightly closed and upright. Keep away from food, drink, and animal foodstuffs. Keep out of the reach of children. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of this product.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: Ammonium Carbamate: No information found.

Ammonium Bicarbonate: No information found.

Engineering Controls: Ensure adequate ventilation. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls.
to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Measures:

Eye/Face Protection: Wear safety glasses with side shields or goggles. Maintain approved eye wash station and accessible rinse facilities in work area.

Skin Protection: Wear appropriate chemical resistant clothing (with long sleeves) and appropriate chemical resistant gloves.

Respiratory Protection: An air-purifying, NIOSH-approved respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Use a positive-pressure, air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are unknown, or if any other circumstances exist where air-purifying respirators may not provide adequate protection.

Specific Requirements for Personal Protective Equipment:

Ensure that glove material is compatible with this product. This information is available from glove manufacturers.

9. PHYSICAL AND CHEMICAL PROPERTIES

Unless otherwise indicated, all properties are given at 25 °C and standard pressure.

Appearance: White, opaque, crystalline solid.

Odor: Ammoniac.

Odor Threshold: No information found.

Formula Weight: Mixture.

pH: 9 (100 g/L aqueous at 20 °C)

Melting/Freezing Point: No information found.

Boiling Point/Range: No information found.

Decomposition Temperature: ≥ 59 °C

Flash Point: Not applicable.

Auto-ignition Temperature: Not applicable.

Flammability: Not flammable.

Flammability/Explosive Limits: Not applicable.

Solubility: 320 g/L aqueous at 20 °C

Vapor Pressure: 52 mmHg at 20 °C; 141 mmHg at 30 °C

Vapor Density: No information found.

Specific Gravity: 1.6 (Water = 1)

Evaporation Rate: No information found.

Viscosity: No information found.

Partition Coefficient (n-octanol/water): No information found.

10. STABILITY AND REACTIVITY

Reactivity Data: No information found.
10. CHEMICAL STABILITY

**Chemical Stability:** Stable under normal conditions. Sensitive to air. Hygroscopic.

**Conditions to Avoid:** Excessive heat, exposure to air, exposure to moisture, incompatible materials.

**Incompatible Materials:** Oxidizers, acids, bases.

**Hazardous Decomposition Products:** Carbon oxides, nitrogen oxides, ammonia.

**Possibility of Hazardous Reactions:** May react vigorously or violently with the incompatible materials listed above. Excessive thermal conditions may yield hazardous decomposition products listed above.

**Hazardous Polymerization:** Will not occur.

11. TOXICOLOGICAL INFORMATION

**Routes of Exposure:** Inhalation, ingestion, skin contact, eye contact.

**Acute Effects:** Harmful if swallowed. May cause irritation to the eyes, skin, respiratory tract, and gastrointestinal tract.

**Chronic Effects:** Prolonged or repeated exposure may affect the lungs.

**Toxicological Data:**

<table>
<thead>
<tr>
<th>Compound</th>
<th>LD&lt;sub&gt;50&lt;/sub&gt; Oral, Rat</th>
<th>LD&lt;sub&gt;50&lt;/sub&gt; Inhalation, Rat</th>
<th>EC&lt;sub&gt;50&lt;/sub&gt; Water Flea (Daphnia magna)</th>
<th>LC&lt;sub&gt;50&lt;/sub&gt; Fathead Minnow (Pimphales promelas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Carbamate</td>
<td>681 mg/kg</td>
<td>6.6 mg/L 4 h</td>
<td>63.7 mg/L 48 h</td>
<td>37.0 mg/L 96 h</td>
</tr>
<tr>
<td>Ammonium Bicarbonate</td>
<td>1580 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Symptoms of Exposure:** Irritation, difficulty breathing, coughing, nausea, vomiting, pulmonary edema.

**Carcinogenic Effects:** This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

12. ECOLOGICAL INFORMATION

**Ecotoxicological Data:**

<table>
<thead>
<tr>
<th>Compound</th>
<th>EC&lt;sub&gt;50&lt;/sub&gt; Water Flea (Daphnia magna)</th>
<th>LC&lt;sub&gt;50&lt;/sub&gt; Fathead Minnow (Pimphales promelas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Carbamate</td>
<td>63.7 mg/L 48 h</td>
<td>37.0 mg/L 96 h</td>
</tr>
<tr>
<td>Ammonium Bicarbonate</td>
<td>145.6 mg/L 48 h</td>
<td>63.4 mg/L 96 h</td>
</tr>
</tbody>
</table>

**Persistence and Degradability:** Not expected to bioaccumulate or biodegrade.

**Environmental Effects:** Harmful to aquatic organisms. Avoid release to the environment.

13. DISPOSAL INFORMATION

**Disposal Instructions:** Dispose of this material and its container to an approved waste collection point. Minimize exposure to product waste (see Section 8). Do not dispose unused waste down drains or into sewers. All wastes must be handled in accordance with local, state, and federal regulations.
Contaminated Packaging: Because containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

Waste Codes: No information found.

14. TRANSPORT INFORMATION

DOT: Not regulated.

Environmental Hazard Regulations: No information found.

Other Transport Precautions: No information found.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

OSHA: This product is considered a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Inventory: All components of this product are on the U.S. TSCA Inventory.

U.S. EPCRA (SARA Title III):

Section 302: No information found.

Sections 311/312:

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>List (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 311 – Hazardous Chemical</td>
<td>Yes</td>
</tr>
<tr>
<td>Immediate Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Delayed Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Pressure Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactivity Hazard</td>
<td>No</td>
</tr>
</tbody>
</table>

Section 313: No information found.

CERCLA Reportable Quantities: Ammonium Carbaminate: 5000 lb Ammonium Bicarbonate: 5000 lb
### International Inventories:

<table>
<thead>
<tr>
<th>Country or Region</th>
<th>Inventory Name</th>
<th>On Inventory (Yes/No)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates that the listed component(s) of this product comply with the inventory requirements administered by the governing country(s).

### 16. OTHER INFORMATION

**Disclaimer:** Rocky Mountain Reagents, Inc. provides the information in this Safety Data Sheet in the belief that it is reliable but assumes no responsibility for its completeness or accuracy. The physical properties reported in this SDS are obtained from literature and do not constitute product specifications. Rocky Mountain Reagents, Inc. makes and gives no representations or warranties with respect to the information contained herein or the product to which it refers, whether express, implied, or statutory, including without limitation, warranties of accuracy, completeness, merchantability, non-infringement, performance, safety, suitability, stability, and fitness for a particular purpose. No warranty against infringement of any patent, copyright or trademark is made or implied. This SDS is intended only as a guide to the appropriate handling of the material by a properly trained person. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. Accordingly, Rocky Mountain Reagents, Inc. assumes no liability whatsoever for the use of or reliance upon this information including results obtained, incidental or consequential damages, or lost profits.

**Issue Date:** May 18, 2016

**Reason for Revision:** Update of Section 9 over 12/08/2015 version.