Ammonium Chloride Solution  
Safety Data Sheet

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product name: Ammonium Chloride Solution

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture: Manufacturing

1.3. Details of the supplier of the safety data sheet
Zaclon LLC  
2981 Independence Road  
Cleveland, OH 44115  
T 216-271-1569 or 800-356-7327

1.4. Emergency telephone number
Emergency number: Chemtrec 1 800 424 9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
GHS-US classification
Acute Tox. 4 (Oral) H302
Eye Irrit. 2A H319

2.2. Label elements
GHS-US labelling
Hazard pictograms (GHS-US):

Signal word (GHS-US): Warning
Hazard statements (GHS-US): H302 - Harmful if swallowed  
H319 - Causes serious eye irritation
Precautionary statements (GHS-US): P264 - Wash thoroughly after handling  
P270 - Do not eat, drink or smoke when using this product  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P301+P312 - IF SWALLOWED: call a POISON CENTER or doctor/physician if you feel unwell  
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P330 - If swallowed, rinse mouth  
P337+P313 - If eye irritation persists: Get medical advice/attention  
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3. Other hazards
No additional information available

2.4. Unknown acute toxicity (GHS-US)
No data available

SECTION 3: Composition/information on ingredients

3.1. Substances
Not applicable
Full text of H-phrases: see section 16

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>(CAS No) 7732-18-5</td>
<td>75 - 80</td>
<td>Not classified</td>
</tr>
<tr>
<td>Ammonium chloride</td>
<td>(CAS No) 12125-02-9</td>
<td>20 - 25</td>
<td>Acute Tox. 4 (Oral), H302</td>
</tr>
</tbody>
</table>
### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

<table>
<thead>
<tr>
<th>First-aid measures after inhalation</th>
<th>If large amounts are inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-aid measures after skin contact</td>
<td>The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable.</td>
</tr>
<tr>
<td>First-aid measures after eye contact</td>
<td>In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.</td>
</tr>
<tr>
<td>First-aid measures after ingestion</td>
<td>If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Call a physician.</td>
</tr>
</tbody>
</table>

#### 4.2. Most important symptoms and effects, both acute and delayed

| Symptoms/injuries after inhalation | None anticipated. |
| Symptoms/injuries after skin contact | Causes severe burns. |
| Symptoms/injuries after eye contact | Causes serious eye irritation. |
| Symptoms/injuries after ingestion | May be harmful if swallowed. May cause nausea, vomiting or acidosis if large amounts are ingested. |

#### 4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

| Suitable extinguishing media | As appropriate for combustibles in area (Foam, Dry Chemical, and CO2). Water spray will reduce irritating fumes and gases. |
| Unsuitable extinguishing media | None. |

#### 5.2. Special hazards arising from the substance or mixture

| Fire hazard | If evaporated and overheated, 260-315°C (500-600°F), hydrogen chloride and ammonia gases may be released. |
| Explosion hazard | None known. |

#### 5.3. Advice for firefighters

Protection during firefighting: Firefighters should wear full protective gear.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

| For non-emergency personnel | No additional information available |
| For emergency responders | No additional information available |

#### 6.2. Environmental precautions

Avoid release to the environment.

#### 6.3. Methods and material for containment and cleaning up

For containment: Stop the flow of material, if this is without risk.  
Methods for cleaning up: Confine spill and soak up with absorbent. Place in an approved container and dispose in accordance with local, state and federal regulations.

#### 6.4. Reference to other sections

No additional information available

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Precautions for safe handling: Avoid breathing fumes. Wash thoroughly after handling.

#### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a tightly closed container in a dry place.

#### 7.3. Specific end use(s)

Manufacturing
SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Ammonium chloride (12125-02-9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA ACGIH</td>
</tr>
<tr>
<td>USA ACGIH</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls: Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.
Hand protection: None required during normal handling conditions.
Eye protection: Use safety glasses.
Skin and body protection: Wear suitable working clothes.
Respiratory protection: If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| Physical state | Liquid |
| Appearance     | Clear  |
| Color          | White  |
| Odor           | Odorless. |
| Odor threshold | No data available |
| pH             | 3 - 6 |
| Relative evaporation rate (butylacetate=1) | No data available |
| Melting point  | No data available |
| Freezing point | 10°F (for 20%)/50°F (for 25%) |
| Boiling point  | No data available |
| Self ignition temperature | No data available |
| Decomposition temperature | No data available |
| Flammability (solid, gas) | No data available |
| Vapor pressure | No data available |
| Relative vapor density at 20 °C | No data available |
| Specific gravity | 1.058 - 1.073 |
| Solubility     | No data available |
| Log Pow        | No data available |
| Log Kow        | No data available |
| Viscosity, kinematic | No data available |
| Viscosity, dynamic | No data available |
| Explosive properties | No data available |
| Oxidizing properties | No data available |
| Explosive limits | No data available |

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

Will not occur.
10.4. Conditions to avoid

None

10.5. Incompatible materials

Incompatible with alkalis, strong oxidants, potassium chlorate.

10.6. Hazardous decomposition products

If evaporated, will decompose with heat, releasing hydrogen chloride and ammonia gases which partially reform ammonium chloride as a dust cloud or smoke.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Harmful if swallowed.

Higher ingestion exposures may lead to non-specific discomfort, such as nausea or vomiting; or profound acidosis.

Ammonium Chloride Solution

<table>
<thead>
<tr>
<th>ATE (oral)</th>
<th>500.000 mg/kg bodyweight</th>
</tr>
</thead>
</table>

Ammonium chloride (12125-02-9)

<table>
<thead>
<tr>
<th>LD50 oral rat</th>
<th>1410 mg/kg</th>
</tr>
</thead>
</table>

Skin corrosion/irritation : Not classified
pH: 3 - 6

Serious eye damage/irritation : Causes serious eye irritation.
pH: 3 - 6

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Tests for mutagenic activity in bacterial or mammalian cell cultures have been inconclusive with positive results in some studies and negative results in others.

Specific target organ toxicity (single exposure) : Not classified

The compound is not a skin irritant and is not an eye irritant in animals. Toxic effects described in animals from short exposures by ingestion include effects on acid-base balance and water metabolism. Toxic effects in animals occurring only with inhalation exposures are lower respiratory irritation.

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ammonium chloride (12125-02-9)

<table>
<thead>
<tr>
<th>LC50 fishes 1</th>
<th>209 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [static])</th>
</tr>
</thead>
</table>

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available
**Ammonium Chloride Solution**

**Safety Data Sheet**

12.5. Other adverse effects

No additional information available

**SECTION 13: Disposal considerations**

13.1. Waste treatment methods

Waste disposal recommendations: Dispose of contents/container in accordance with local/regional/national/international regulations.

**SECTION 14: Transport information**

In accordance with DOT

Transport document description: UN3082 Environmentally hazardous substances, liquid, n.o.s. (Contains Ammonium Chloride), 9, III

UN-No.(DOT): 3082

DOT NA no.: UN3082

DOT Proper Shipping Name: Environmentally hazardous substances, liquid, n.o.s. (Contains Ammonium Chloride)

Department of Transportation (DOT) Hazard Classes: 9 - Class 9 - Miscellaneous hazardous material 49 CFR 173.140

Hazard labels (DOT): 9 - Class 9 (Miscellaneous dangerous materials)

**DOT Symbols**

G - Identifies PSN requiring a technical name

**Packing group (DOT)**

III - Minor Danger

**DOT Special Provisions (49 CFR 172.102)**

8 - A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substances, liquid or solid, n.o.s.,” as appropriate. In addition, for solid materials, special provision B54 applies.

146 - This description may be used for a material that poses a hazard to the environment but does not meet the definition for a hazardous waste or a hazardous substance, as defined in 171.8 of this subchapter, or any hazard class as defined in Part 173 of this subchapter, if it is designated as environmentally hazardous by the Competent Authority of the country of origin, transit or destination.

173 - An appropriate generic entry may be used for this material.

335 - Mixtures of solids that are not subject to this subchapter and environmentally hazardous liquids or solids may be classified as “Environmentally hazardous substances, solid, n.o.s,” UN3077 and may be transported under this entry, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each transport unit must be leakproof when used as bulk packaging.

IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).

T4 - 2.65 178.274(d)(2) Normal.............. 178.275(d)(3)

TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 97 / (1 + a (tr - tf)) Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.

TP29 - A portable tank having a minimum test pressure of 1.5 bar (150.0 kPa) may be used provided the calculated test pressure is 1.5 bar or less based on the MAWP of the hazardous materials, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.

**DOT Packaging Exceptions (49 CFR 173.xxx)**

155

**DOT Packaging Non Bulk (49 CFR 173.xxx)**

203

**DOT Packaging Bulk (49 CFR 173.xxx)**

241

**DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)**

No limit

**DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)**

No limit

**DOT Vessel Stowage Location**

A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.
SECTION 15: Regulatory information

15.1. US Federal regulations

Water (7732-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ammonium chloride (12125-02-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State regulations

Ammonium chloride (12125-02-9)
U.S. - Massachusetts - Right To Know List
U.S. - Minnesota - Hazardous Substance List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Full text of H-phrases:

<table>
<thead>
<tr>
<th>Acute Tox. 4 (Oral)</th>
<th>Acute toxicity (oral), Category 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Irrit. 2A</td>
<td>Serious eye damage/eye irritation, Category 2A</td>
</tr>
<tr>
<td>H302</td>
<td>Harmful if swallowed</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
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</tbody>
</table>

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.