Ammonium Fluorosilicate, Crystal
Material Safety Data Sheet

Chemical: Ammonium Fluorosilicate
NFPA: H=2  F=0  I=1  S=None
HMIS: H=2  F=0  R=1  PPE= Supplied by user; dependent on conditions

MSDS Number: AFS-1103
Effective Date: 19 November 2003
Issued by: Solvay Chemicals, Inc. Regulatory Affairs Department

Not valid three years after effective date or after issuance of superseding MSDS, whichever is earlier. French or Spanish translations of this MSDS may be available. Check www.solvaychemicals.us or call Solvay Fluorides, LLC to verify the latest version or translation availability.

Material Safety Data Sheets contain country-specific regulatory information. Therefore the MSDS’s provided are for use only by customers of Solvay Fluorides, LLC in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location.

1. Company and Product Identification

1.1 Product Name: Ammonium Fluorosilicate, Crystal

Chemical Name: Ammonium Fluorosilicate
Synonyms: Ammonium silico-fluoride, Ammonium hexafluorosilicate
Chemical Formula: \((\text{NH}_4)_2\text{SiF}_6\)
Molecular Weight: 178.14
CAS Number: 16919-19-0
EINECS Number: Unknown
Grade/Trade Names: None

1.2 Recommended Uses: Contact supplier

1.3 Supplier: Solvay Fluorides, LLC
PO BOX 27328 Houston, TX 77227-7328
3333 Richmond Ave. Houston, Texas 77098

1.4 Emergency Telephone Numbers
Emergencies (USA): 1-800-424-9300 (CHEMTREC®)
Transportation Emergencies (INTERNATIONAL/MARITIME): 1-703-527-3887 (CHEMTREC®)
Transportation Emergencies (CANADA): 1-613-996-6666 (CANUTEC)
Transportation Emergencies (MEXICO-SETIQ): 01-800-00-214-00 (MEX. REPUBLIC)
525-559-1588 (Mexico City and Metro Area)
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2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>FORMULA</th>
<th>WT. PERCENT</th>
<th>CAS #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium fluorosilicate</td>
<td>(NH₄)₂SiF₆</td>
<td>≥ 98</td>
<td>16919-19-0</td>
</tr>
</tbody>
</table>

3. Hazards Identification

Emergency Overview:

3.1 Route of Entry: Inhalation: Yes  Skin: Yes  Ingestion: Yes

3.2 Potential Effects of exposure:

- Repeated or prolonged exposure to excessive concentrations may cause fluoride poisoning.
- Symptoms includes weakness, tremors, convulsions, collapse, low blood-calcium levels and coma.

Inhalation:
- Irritation to the nose, throat, mucous membranes and lungs.
- Coughing and difficult breathing may occur.

Eyes: Severe irritation with redness and pain.

Skin contact: Irritation and burning sensation.

Ingestion:
- Gastrointestinal irritation with nausea and vomiting.
- Loss of consciousness may occur.

Carcinogenicity: See section 11.3.

4. First-Aid Measures

General Recommendations:

4.1 Inhalation:
- Remove the subject to fresh air.
- Administer oxygen or cardiopulmonary resuscitation if necessary.
- Seek medical attention immediately.

Eyes:
- Flush eyes with running water for at least 15 minutes, while keeping the eyelids wide open.
- Seek medical attention immediately.

Skin:
- Remove contaminated shoes, socks and clothing, while washing the affected skin with soap and water.
- Seek medical attention immediately.
Ingestion: Seek medical attention immediately.

If the subject is completely conscious:
- Give subject large quantities of water.
- Do not induce vomiting.

If the subject is unconscious:
- NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
- Administer classical resuscitation measures.

4.2 Medical Treatment/Notes to Physician: None.

5. Fire-Fighting Measures

5.1 Flash point: Does not exhibit a flash point.

5.2 Auto-ignition Temperature: No data.

5.3 Flammability Limits: Non-flammable; may burn but does not readily ignite.

5.4 Unusual Fire and Explosion Hazards: None.

5.5 Extinguishing Methods
- Common: Use extinguishing media suitable for surrounding materials.
- Inappropriate extinguishing means: No restriction.

5.6 Fire Fighting Procedures
- Specific hazards: None.

Protective measures in case of intervention: Wear appropriate apparel and NIOSH-approved respirators.

6. Accidental Release Measures

6.1 Precautions: Follow the protective measures given in section 8.

6.2 Precautions for protection of the environment:
- Sweep or shovel into containers for reuse or disposal.
- Wear protective clothing and NIOSH-approved respirators.
- For disposal methods, refer to section 13.

6.3 Cleanup methods:
- Immediately notify the appropriate authorities in case of reportable discharge.
- Do not discharge into the environment (sewers, rivers, soils, ...).
7. Handling and Storage

7.1 Handling:
- Use only equipment and materials which are compatible with the product.
- Keep away from heat and reactive products (see section 10).
- Wash thoroughly after handling.

7.2 Storage:
- Store in dry area.
- Keep in original packaging, and tightly closed.
- Keep away from heat and reactive products (see section 10).

7.3 Specific Uses: See section 1.2.

7.4 Other precautions:
- Warn people about the hazards of the material.
- Follow the protective measures given in section 8.

7.5 Packaging: Consult supplier.

8. Exposure Controls/Personal Protection

8.1 Exposure Limit Values

<table>
<thead>
<tr>
<th>Authorized limit Values</th>
<th>TLV® ACGIH®-USA (2002)</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorides</td>
<td>2.5 mg/m³</td>
<td>2.5 mg/m³</td>
</tr>
</tbody>
</table>

ACGIH® and TLV® are registered trademarks of the American Conference of Governmental Industrial Hygienists.

8.2 Exposure Controls:
- Follow the protective measures given in section 7.
- Maintain employee exposures to levels below the applicable exposure limits.

8.2.1 Occupational Exposure Controls:

8.2.1.1 Ventilation: Provide adequate ventilation.

8.2.1.2 Respiratory protection: Use only NIOSH/MSHA-approved respirators for dusts.

8.2.1.3 Hand protection: Protective gloves - chemical resistant: neoprene, and rubber.

8.2.1.4 Eye protection: Chemical safety glasses.

8.2.1.5 Skin protection: Appropriate protective chemical-resistant clothing.

8.3 Other precautions:
- Provide shower and eyewash stations.
- Avoid breathing dust.
- Avoid contact with eyes, skin and clothing.
- Wash thoroughly after handling.
- Do not swallow material.
- Consult the industrial hygienist or the safety manager for the selection of personal protective equipment suitable for the working conditions.
9. Physical and Chemical Properties

9.1 Appearance: Crystalline solid.
Color: White.
Odor: Odorless.

9.2 Important Health, Safety and Environmental information:

pH: No data.
Change of state:
Melting point: No data.
Boiling point: Decomposes @100°C (212°F).
Decomposition Temperature: @100°C (212°F)

Flash Point: Does not exhibit a flash point.
Flammability: Non-flammable.
Explosive Properties: No data.
Oxidizing Properties: Not applicable.
Vapor Pressure: Nil
Relative Density:
Specific gravity (H₂O=1): 2.011.

Solubility:
Water: 18% @ 63°F (17°C).
Fat: No data.
Partition coefficient: No data.
Viscosity: No data.
Vapor Density (air=1): No data.
Evaporation Rate: No data.

10. Stability and Reactivity

10.1 Conditions to avoid: Extreme heat.

10.2 Materials and substances to avoid:
- Cyanides.
- Reactive materials (aluminum, magnesium).
- Alkalis.

10.3 Hazardous decomposition products:
- Hydrogen fluoride.
- Ammonia.
- Toxic oxides of nitrogen.

10.4 Hazardous Polymerization: Will not occur.
11. Toxicological Information

11.1 Acute toxicity:
   Inhalation: No data.
   Oral: LD$_{50}$, rat, 125 mg/kg (sodium hexafluorosilicate).
   Dermal: No data.
   Irritation: No data.
   Sensitization: No data.
   Comments: None.

11.2 Chronic toxicity: No data.

11.3 Carcinogenic Designation: None.

12. Ecological Information

12.1 Acute ecotoxicity: No data.

12.2 Chronic ecotoxicity: No data.

12.3 Mobility: No data.

12.4 Degradation
   Abiotic: No data.
   Biotic: No data.

12.5 Potential for bioaccumulation: No data.

12.6 Other adverse effects /Comments: None.

13. Disposal Considerations

13.1 Waste treatment: Consult current federal, state and local regulations regarding the proper disposal of this material.

13.2 Packaging treatment: Consult current federal, state and local regulations regarding the proper disposal of emptied containers.

13.3 RCRA Hazardous Waste: Not listed.
14. Transport Information

<table>
<thead>
<tr>
<th>Mode</th>
<th>DOT</th>
<th>IMDG</th>
<th>IATA</th>
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<td>Class (Subsidiary)</td>
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<td>6.1</td>
<td>6.1</td>
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<tr>
<td>Proper Shipping Name</td>
<td>Ammonium Fluorosilicate</td>
<td>Ammonium Fluorosilicate</td>
<td>Ammonium Fluorosilicate</td>
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<td>Hazard label (Subsidiary)</td>
<td>Poison</td>
<td>Poison</td>
<td>Poison</td>
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<tr>
<td>Marine Pollutant</td>
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<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Placard (Subsidiary)</td>
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<td>Packing Group</td>
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<td>Reportable Quantity</td>
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<td>MFAG</td>
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15. Regulatory Information

National Regulations (US)

TSCA Inventory 8(b): Yes.

SARA Title III Sec. 302/303 Extremely Hazardous Substances (40 CFR 355): No.

SARA Title III Sec. 311/312 (40 CFR 370): Yes.

Hazard Category: Acute health hazard.
Threshold planning quantity: 10,000 lbs.

SARA Title III Sec. 313 Toxic Chemical Emissions Reporting (40 CFR 372): No.

CERCLA Hazardous Substance (40 CFR Part 302)

Listed Substance: No.
Unlisted Substance: No.

State Component Listing:

<table>
<thead>
<tr>
<th>State</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>Hazardous Substance List</td>
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<tr>
<td>CT</td>
<td>Hazardous Material Survey</td>
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<tr>
<td>IL</td>
<td>Chemical Safety Act</td>
</tr>
<tr>
<td>IL</td>
<td>Toxic Substances Disclosure to Employees Act</td>
</tr>
<tr>
<td>LA</td>
<td>Right to Know List</td>
</tr>
<tr>
<td>MA</td>
<td>Oil and Hazardous Materials List</td>
</tr>
<tr>
<td>MA</td>
<td>Right to Know Substance List</td>
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<tr>
<td>NJ</td>
<td>Right to Know Substance List</td>
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<tr>
<td>NJ</td>
<td>Spill Tax List</td>
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<tr>
<td>NY</td>
<td>Release Reporting List of Hazardous Substances</td>
</tr>
<tr>
<td>PA</td>
<td>Right to Know</td>
</tr>
</tbody>
</table>

National Regulations (Canada)

Canadian DSL Registration: DSL.
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WHMIS Classification: D2B - Material causing other toxic effect.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations, and the MSDS contains all the information required by the Controlled Products Regulations.

Labeling according to Directive 1999/45/EC.

<table>
<thead>
<tr>
<th>Category</th>
<th>ID</th>
<th>Phrase</th>
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</thead>
<tbody>
<tr>
<td>Symbols</td>
<td>None</td>
<td></td>
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<tr>
<td>Phrases R</td>
<td>23/24/25</td>
<td>Toxic by inhalation, in contact with skin and if swallowed.</td>
</tr>
<tr>
<td>Phrases S</td>
<td>1/2</td>
<td>Keep locked up and out of reach of children.</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.</td>
</tr>
<tr>
<td></td>
<td>45</td>
<td>In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).</td>
</tr>
</tbody>
</table>

16. Other Information

16.1 Ratings:
NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
Health = 2 Flammability = 0 Instability = 1 Special = None

HMIS (HAZARDOUS MATERIAL INFORMATION SYSTEM)
Health = 2 Fire = 0 Reactivity = 1 PPE = Supplied by User; dependent on local conditions

16.2 Other Information:
The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

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16.3 Reason for revision:
Purpose of revision: Change Company name and MSDS format