Material Safety Data Sheet

Tetrabutylammonium fluoride MSDS

Section 1: Chemical Product and Company Identification

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Contact Information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrabutylammonium fluoride</td>
<td>Finar Limited</td>
</tr>
<tr>
<td>Catalog Codes: 11785,11786</td>
<td>184-186/P, Chacharwadi Vasna, Sarkhej-Bavla Highway, Ta.: Sanand, Dist.: Ahmedabad, Email: <a href="mailto:info@finarchemicals.com">info@finarchemicals.com</a></td>
</tr>
<tr>
<td>CAS#:</td>
<td>429-41-4</td>
</tr>
<tr>
<td>RTECS:</td>
<td></td>
</tr>
<tr>
<td>TSCA:</td>
<td></td>
</tr>
<tr>
<td>CI#:</td>
<td></td>
</tr>
<tr>
<td>Synonym: TBAF.</td>
<td></td>
</tr>
<tr>
<td>Chemical Formula: C16H42FNO3</td>
<td>Web: <a href="http://www.finarchemicals.com">www.finarchemicals.com</a></td>
</tr>
</tbody>
</table>

Section 2: Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrabutylammonium fluoride</td>
<td>429-41-4</td>
<td></td>
</tr>
</tbody>
</table>

Section 3: Hazards Identification

Emergency Overview
Warning! Hygroscopic (absorbs moisture from the air). Contact with acids liberates toxic gas. Causes eye, skin, and respiratory tract irritation. Target Organs: Respiratory system, eyes, skin.

Potential Health Effects
Eye:
Causes eye irritation. May cause blindness. May cause permanent corneal opacification. May cause chemical conjunctivitis and corneal damage.

Skin:
Causes skin irritation. May cause cyanosis of the extremities.

Ingestion:
May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause cardiac disturbances. Ingestion of large amounts may cause CNS depression.

Inhalation:
Causes respiratory tract irritation. Vapors may cause dizziness or suffocation. May cause cardiac abnormalities. Inhalation at high concentrations may cause CNS depression and asphyxiation. May cause burning sensation in the chest. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

Chronic: Effects may be delayed.

Section 4: First Aid Measures

Eyes:
Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:
Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Get medical aid.
**Inhalation:**
Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

**Notes to Physician:**

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**Section 5: Fire and Explosion Data**

**General Information:**
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable liquid and vapor. May form explosive peroxides. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Will be easily ignited by heat, sparks or flame. May accelerate burning if involved in a fire. Containers may explode when heated. Runoff from fire control or dilution water may cause pollution.

**Extinguishing Media:**
Water may be ineffective. Do NOT use straight streams of water. For large fires, use water spray, fog or regular foam. For small fires, use dry chemical, carbon dioxide, water spray or regular foam. Cool containers with flooding quantities of water until well after fire is out.

**Flash Point:** -17 deg C (1.40 deg F)
**Autoignition Temperature:** Not applicable.
**Explosion Limits, Lower:** Not available.  **Upper:** Not available.
**NFPA Rating:** (estimated) Health: 2; Flammability: 4; Instability: 1

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**Section 6: Accidental Release Measures**

**General Information:**
Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:**
Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Isolate area and deny entry. Provide ventilation. Place under an inert atmosphere. Do not use combustible materials such as paper towels to clean up spill. A vapor suppressing foam may be used to reduce vapors.

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**Section 7: Handling and Storage**

**Handling:**
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Use with adequate ventilation. If peroxide formation is suspected, do not open or move container. Avoid contact with air and sunlight. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Unused chemicals should not be returned to the container. Do not distill since this removes peroxide-inhibitors.

**Storage:**
Keep away from sources of ignition. Do not store in direct sunlight. Store in a tightly closed container. Flammables-area. Regularly check inhibitor levels to maintain peroxide levels below 1%. Do not break the seal on the container until it is needed. Label the container with the date it was first opened. Long-term storage is not recommended.

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

**Engineering Controls:**
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

**Exposure Limits**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrabutylammonium fluoride</td>
<td>none listed</td>
<td>none listed</td>
<td>2.5 mg/m3 TWA (as F) (listed under Fluorides).</td>
</tr>
</tbody>
</table>
OSHA Vacated PELs:
Tetrahydrofuran: 200 ppm TWA; 590 mg/m3 TWA Tetrabutylammonium fluoride: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment
Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin:
Wear appropriate protective gloves and clothing to prevent skin exposure.
Clothing:
Wear appropriate protective clothing to minimize contact with skin.
Respirators:
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9: Physical and Chemical Properties
- Physical State: Liquid
- Appearance: clear amber to brown
- Odor: None reported.
- pH: 7 (5% aq.sol.)
- Vapor Pressure: Not available.
- Vapor Density: 9.01
- Evaporation Rate: Not available.
- Viscosity: Not available.
- Boiling Point: Not available.
- Freezing/Melting Point: 58 - 60 °C
- Decomposition Temperature: Not available.
- Solubility: Water soluble
- Specific Gravity/Density: 0.8870g/cm3
- Molecular Formula: C16H36FN
- Molecular Weight: 261.46

Section 10: Stability and Reactivity Data
- Chemical Stability:
  Stable at room temperature in closed containers under normal storage and handling conditions. On long term storage, substances with similar functional groups form explosive peroxides. Peroxide formation may occur in containers that have been opened and remain in storage.
- Conditions to Avoid:
  Incompatible materials, ignition sources, exposure to air, excess heat, strong oxidants.
- Incompatibilities with Other Materials:
  Oxidizing agents.
- Hazardous Decomposition Products:
  Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, hydrogen fluoride gas, nitrogen.
- Hazardous Polymerization: Has not been reported.

Section 11: Toxicological Information
- RTECS#: CAS# 87749-50-6: None listed
- LD50/LC50: RTECS: Not available.
- Carcinogenicity: Tetrabutylammonium fluoride trihydrate - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
- Other: The toxicological properties have not been fully investigated.

Section 12: Ecological Information
- Other: Do not empty into drains.
Section 13: Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:**

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Section 14: Transport Information

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<tr>
<th></th>
<th>US DOT</th>
<th>Canada TDG</th>
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<tbody>
<tr>
<td><strong>Shipping Name:</strong></td>
<td>FLAMMABLE LIQUIDS, N.O.S.</td>
<td>FLAMMABLE LIQUID NOS</td>
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<td><strong>Hazard Class:</strong></td>
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<tr>
<td><strong>UN Number:</strong></td>
<td>UN1993</td>
<td>UN1993</td>
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<tr>
<td><strong>Packing Group:</strong></td>
<td>II</td>
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<tr>
<td><strong>Additional Info:</strong></td>
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<td>FP-17</td>
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**US FEDERAL**

**TSCA**
- CAS# 109-99-9 is listed on the TSCA inventory.
- CAS# 429-41-4 is listed on the TSCA inventory.
- CAS# 7732-18-5 is listed on the TSCA inventory.

**Health & Safety Reporting List**
None of the chemicals are on the Health & Safety Reporting List.

**Chemical Test Rules**
CAS# 109-99-9: Testing required by manufacturers, processors; Test for Health Effects

**Section 12b**
CAS# 109-99-9: Section 4

**TSCA Significant New Use Rule**
None of the chemicals in this material have a SNUR under TSCA.

**CERCLA Hazardous Substances and corresponding RQs**
CAS# 109-99-9: 1000 lb final RQ; 454 kg final RQ

**SARA Section 302 Extremely Hazardous Substances**
None of the chemicals in this product have a TPQ.

**SARA Codes**
CAS # 109-99-9: immediate, fire, reactive.

**Section 313**
No chemicals are reportable under Section 313.

**Clean Air Act:**
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

**Clean Water Act:**
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**
None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**
- CAS# 109-99-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
- CAS# 429-41-4 can be found on the following state right to know lists: California, (listed as Fluorides), Pennsylvania, (listed as Fluorides), Minnesota, (listed as Fluorides).
- CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

**California Prop 65**
California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations**

**European Labeling in Accordance with EC Directives**

**Hazard Symbols:**
- XI F

**Risk Phrases:**
- R 11 Highly flammable.
**Safety Phrases:**
- S 16 Keep away from sources of ignition - No smoking.
- S 29 Do not empty into drains.
- S 33 Take precautionary measures against static discharges.
- S 9 Keep container in a well-ventilated place.

**WGK (Water Danger/Protection)**
- CAS# 109-99-9: 1
- CAS# 429-41-4: No information available.
- CAS# 7732-18-5: No information available.

**Canada - DSL/NDSL**
- CAS# 109-99-9 is listed on Canada's DSL List.
- CAS# 429-41-4 is listed on Canada's DSL List.
- CAS# 7732-18-5 is listed on Canada's DSL List.

**Canada - WHMIS**
- This product has a WHMIS classification of B2, D2B.
- This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

**Canadian Ingredient Disclosure List**
- CAS# 109-99-9 is listed on the Canadian Ingredient Disclosure List.
- CAS# 429-41-4 is not listed on the Canadian Ingredient Disclosure List.

<table>
<thead>
<tr>
<th>Section 16: Other Information</th>
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</thead>
<tbody>
<tr>
<td><strong>References:</strong> Not available.</td>
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<tr>
<td><strong>Other Special Considerations:</strong> Not available.</td>
</tr>
<tr>
<td><strong>Created:</strong> 10/06/2010</td>
</tr>
<tr>
<td><strong>Last Updated:</strong> 24/11/2012</td>
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