MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Hydrogen Fluoride-Pyridine, Pyridinium Poly (Hydrogen Fluoride), Pyridine Hydrofluoride.

MOLECULAR FORMULA: (C₅H₅N)ₙ(HF)ₓ

GENERAL USE: Fluorinating agent for custom chemical synthesis applications.

PRODUCT DESCRIPTION: Pale Yellow to Light Brown Liquid

<table>
<thead>
<tr>
<th>Manufacturers Name:</th>
<th>DATE PREPARED: 03/12/2008</th>
<th>Page 1 of 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iofina Chemical</td>
<td>SUPERSEDES: 01/2007</td>
<td></td>
</tr>
</tbody>
</table>

ADDRESS (NUMBER, STREET, P.O. BOX) | TELEPHONE NUMBER FOR INFORMATION / customer service |
1025 Mary Laidley Drive             | 1-859-356-8000                      |

(CITY, STATE AND ZIP CODE) COUNTRY | CHEMTEL 24-HOUR EMERGENCY TELEPHONE NUMBER |
Covington, KY 41017 USA             | North America: 1-800-255-3924         |
|                                   | International: +01-813-248-0585       |

DISTRIBUTOR'S NAME
Not Applicable

ADDRESS (NUMBER, STREET, P.O. BOX) TELEPHONE NUMBER FOR INFORMATION / customer service

SECTION 2 - HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>% (by Weight)</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>Hazard Symbol</th>
<th>RISK PHRASES (Full Text Section 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Fluoride-Pyridine</td>
<td>HF=10-70 Pyridine=30-90</td>
<td>[32001-55-1]</td>
<td>250-889-6</td>
<td>None Listed*</td>
<td>None Listed*</td>
</tr>
</tbody>
</table>

Notes: * This substance is not classified in the Annex I of Directive 67/548/EEC. This substance is not listed in the Annex I of Council Regulation No (EC) 304/2003. This substance is not listed in a priority list (as foreseen under Council Regulation (EEC) No 793/93 on the evaluation and control of the risks of existing substances.).

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Caution! May cause eye and skin irritation with possible burns. May cause respiratory and digestive tract irritation and possible burns. Moisture sensitive. The toxicological properties of this material have not been fully investigated.

POTENTIAL HEALTH EFFECTS

INHALATION: The toxicological properties of this substance have not been fully investigated. May cause severe respiratory tract irritation and possible burns.

SKIN: May cause skin irritation and possible burns. The toxicological properties of this material have not been fully investigated.

EYES: Contact with eyes may cause severe irritation, and possible eye burns. The toxicological properties of this material have not been fully investigated.

INGESTION: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

CARCINOGENICITY NTP? No IARC MONOGRAPHS? No OSHA REGULATED? No

Cal. Prop. 65? No
SECTION 4 - FIRST AID MEASURES

Use good personal hygiene practices. If skin contact should occur, material should be washed away with a mild soap and water. Wash hands and other exposed areas thoroughly before eating, drinking, smoking or using toilet facilities. Do not smoke, drink or eat in areas where this product is stored or handled.

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.

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

SKIN: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

INGESTION: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

SECTION 5 - FIRE FIGHTING MEASURES

GENERAL HAZARDS: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

EXTINGUISHING MEDIA: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

FIRE FIGHTING PROCEDURES: Wear full protective equipment including impervious clothing and full self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Combustion may result in the release of toxic gases.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Use proper protective gear before attempting to clean up any spill of this product. Skin exposure should especially be avoided. Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation. Collect and dispose of the waste in accordance with all applicable Federal, State, and local laws.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Handling: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. **Do not store in glass.**

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS</th>
<th>NIOSH TWA ppm</th>
<th>NIOSH TWA mg/m³</th>
<th>ACGIH STEL ppm</th>
<th>ACGIH STEL mg/m³</th>
<th>OSHA PEL ppm</th>
<th>OSHA PEL mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Fluoride-Pyridine (10-70%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.5 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TWA (as F)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(listed under Fluorides).</td>
</tr>
</tbody>
</table>
PERSONAL PROTECTION: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

RESPIRATORY PROTECTION: 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. Wear an organic vapor mask.

PROTECTIVE GLOVES: Wear appropriate protective rubber gloves to prevent skin exposure.

EYE PROTECTION: Wear appropriate protective eyeglasses with side shields, chemical safety goggles, full face shield as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Wear appropriate protective clothing to prevent skin exposure including a rubber apron.

WORK / HYGIENIC PRACTICES: Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. **Always use a mechanical fume hood when handling this material!**

### SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance and Odor</td>
<td>Yellow to brown liquid</td>
</tr>
<tr>
<td>pH</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point / Boiling Range</td>
<td>Not available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>None</td>
</tr>
<tr>
<td>Flammable Limits</td>
<td>LEL: N/A</td>
</tr>
<tr>
<td></td>
<td>UEL: N/A</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Specific Gravity (Water = 1)</td>
<td>Pyr=0.978 HF=0.987 @20°C</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Completely Soluble</td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>N/A</td>
</tr>
<tr>
<td>Evaporation Rate (Water = 1)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### SECTION 10 - STABILITY AND REACTIVITY

| Stability                        | X Stable               |
| Conditions to Avoid              | Incompatible materials, temperatures above 50°C (122°F), moist air. |
| Incompatibility (Materials to Avoid) | Strong oxidizing agents, bases. |
| Hazardous Decomposition or Byproducts | Nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, hydrogen fluoride gas. |
| Hazardous Polymerization         | Will not occur         |

### SECTION 11 - TOXICOCLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>CAS # (EINECS #)</th>
<th>LD50 of Ingredient (Specify Species and Route)</th>
<th>LC50 of Ingredient (Specify Species)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Fluoride-Pyridine (10-70%)</td>
<td>32001-55-1 (250-889-6)</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

No information available.

### SECTION 12 - ECOLOGICAL INFORMATION

---

**SECTION 13 - DISPOSAL CONSIDERATIONS**

Waste Disposal Method:
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:** None listed.
SECTION 14 - TRANSPORT INFORMATION

PROPER SHIPPING NAME: Product with >60% Hydrogen Fluoride: Corrosive Liquid, toxic, N.O.S., (Hydrogen Fluoride-Pyridine), 8, UN 2922, PG I.
Product with <60% Hydrogen Fluoride: Corrosive Liquid, toxic, N.O.S., (Hydrogen Fluoride-Pyridine), 8, UN 2922, PG II.

DOT HAZARD CLASS / Pack Group: 8, PG I or II.
UN / NA IDENTIFICATION NUMBER: UN 2922.
LABEL: Corrosive liquid, toxic, N.O.S., 8, UN 2922 (Hydrogen Fluoride-Pyridine).
HAZARD SYMBOLS: Toxic, Corrosive.

IATA HAZARD CLASS / Pack Group: 8, PG I or II.
IMDG HAZARD CLASS: 8.
UN TDG Class / Pack Group: 8, PG I or II.
Hazard Identification Number (HIN): Not Available.

Note: Transportation information provided is for reference only. Client is urged to consult CFR 49 parts 100 - 177, IMDG, IATA, EU, United Nations TDG, and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

SECTION 15 - REGULATORY INFORMATION

TSCA (USA - Toxic Substance Control Act) Listed.
SARA TITLE III (USA - Superfund Amendments and Reauthorization Act): No.

313 REPORTABLE INGREDIENTS: Not listed.

CERCLA (USA - Comprehensive Response Compensation and Liability Act):

CPR (Canadian Controlled Products Regulations): Not listed.

IDL (Canadian Ingredient Disclosure List): Not listed.

DSL / NDSL (Canadian Domestic Substances List / Non-Domestic Substances List): NDSL Listed.

EINECS (European Inventory of Existing Commercial Chemical Substances): Listed.

WGK Water Quality Index:

<table>
<thead>
<tr>
<th>RISK PHRASES:</th>
<th>SYMBOL(S) REQUIRED FOR EU LABEL</th>
<th>SAFETY PHRASES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

SECTION 16 - OTHER INFORMATION

HMIS HAZARD RATINGS

<table>
<thead>
<tr>
<th>HEALTH:</th>
<th>FLAMMABILITY:</th>
<th>REACTIVITY:</th>
<th>PERSONAL PROTECTIVE EQUIPMENT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
<td>H</td>
</tr>
</tbody>
</table>

0 = INSIGNIFICANT
1 = SLIGHT
2 = MODERATE
3 = HIGH
4 = EXTREME

REVISION SUMMARY: Supersedes 01/2007 issue.

MSDS Prepared by:
ChemTel Inc.
1305 North Florida Avenue
Tampa, Florida USA 33602-2902
Toll Free North America 1-888-255-3924 Intl. +01 813-248-0573
Website: www.chemtelinc.com

The information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.