STANDARD OPERATING PROCEDURE-HYDROFLUORIC ACID

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| **CONTACT INFORMATION** | | | |
| **Location** | Building: | | Room: |
| **Street Address:** |  | | |
| **Lab Safety Contact:** | Name: | | |
| Lab Phone: | Office Phone: | |
| **Emergency Contact** | Name: | Phone: | |
| **TYPE OF STANDARD OPERATING PROCEDURE** | | | |
| Indicate which type of Standard Operating Procedure applies  Specific Process or Equipment  Specific Hazardous Chemical  Hazard Class for a Group of Chemicals | | | |
| **DESCRIBE PROCESS/EQUIPMENT, HAZARDOUS CHEMICAL or HAZARD CLASS** | | | |
| **Hydrofluoric Acid (HF)**  **Formula:** HF  **CAS Number:** 7664-39-3  **Other Names:** Fluorane, Fluorhydric acid | | | |
| **HAZARD SUMMARY** | | | |
| Liquid HF is one of the strongest and most corrosive acids. It can be irritating to the skin, eyes, and respiratory tract. Contact with exposed body parts can cause painful burns and even death. In high concentrations (more than 50%), HF usually causes immediate burns that are extremely painful and slow to heal. In lower concentrations, exposure may not be apparent for several hours, but can still cause burns and further damage if not washed off. HF causes such severe burns because it penetrates beneath the skin and dissociates into hydrogen and fluoride ions. When fluoride ions bind with calcium in the body, it can result in tissue destruction, decalcification of bone, cardiac arrhythmia, and liver and kidney damage.  **Inhalation:** Remove person to fresh air and loosen tight clothing if needed. Give artificial respiration if necessary. Consult a doctor/medical service.  **Skin Contact:** Wash immediately with water (15 minutes)/shower while applying calcium gluconate. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention.  **Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Consult a doctor/medical service immediately.  **Ingestion:** Rinse mouth. Do not induce vomiting. Immediately consult a doctor/medical service. | | | |
| **SPECIAL HANDLING AND STORAGE REQUIREMENTS** | | | |
| **Precautions:**  Consider alternate methods and use a less dangerous acid if possible. Purchase HF in the smallest amounts possible.  Stock calcium gluconate gel and calcium carbonate antacid tablets (Tums) to be used as first aid in case of an HF burn. (Medical attention should still be sought immediately for HF burns.) Prior to using HF, make sure the calcium gluconate tube is unopened and that neither the gel nor the tablets have reached their expiration date. Calcium gluconate gel and calcium carbonate are stored (list location) in this lab. Do not heat hydrofluoric acid. Do not use glass, ceramic, or other incompatible containers for HF. Reactions with metals may produce Hydrogen gas. Perform a dry run to identify and correct potential hazards. Add acid to water, not water to acid. Work within sight and/or hearing of at least one other person who is familiar with the hazards and written procedures. Set up a designated area for HF use and post a warning sign during use. Post a sign at the door to the room when HF is in use. Line work surfaces with plastic-backed absorbent paper and/or a containment tray of compatible material. Once work with HF is complete, decontaminate the area by wiping it down with a 10% sodium carbonate (Na2CO3, also known as soda ash) solution.  **Storage:**  Store in a secondary container made of polyethylene. Keep container tightly closed in a cool, dry, and well-ventilated area or in a designated acid storage cabinet. Opened containers must be carefully resealed and kept upright to prevent leakage. Protect from heat. Avoid strong oxidizing agents, strong bases, strong acids, and strong reducing agents. | | | |
| **ENGINEERING AND VENTILATION CONTROLS** | | | |
| Handle only in a chemical fume hood. The room where the chemical is being used should be equipped with proper exhaust ventilation to keep the airborne concentration below the allowable exposure limit. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. | | | |
| **PERSONAL PROTECTIVE EQUIPMENT** | | | |
| **PPE Requirements:**  Long pants or clothing that covers all skin below the waist  Shoes that cover the entire foot  Gloves; indicate type: Neoprene outer and Nitrile inner gloves  Inspect gloves before use. Use proper glove removal technique to avoid skin contact with outer surface of glove. Wash hands after removing gloves.  Safety goggles  Safety glasses  Face shield  Lab coat  Flame-resistant lab coat  Other: Click here to enter text.  If the use of an N95, half mask, or full face respirator is requested, the individual and/or their supervisor must first contact Environmental Health & Safety for a consultation to determine if respirator use is necessary. If EH&S determines the use of a respirator is necessary, the individual must participate in the University’s respirator program. This includes a medical evaluation; respirator fit test, and training. | | | |
| **EMERGENCY PROCEDURES** | | | |
| In case of fire or large and/or extremely hazardous chemical releases pull the fire alarm and evacuate the area  If someone is seriously injured or unconscious  **CALL 911 or CAMPUS POLICE AT <enter your campus PD #>**  From a safe place, provide as much information as possible to the emergency responders including chemical name, volume, hazards, injuries, and location.  **Chemical Exposure**: Remove any contaminated clothing, and IMMEDIATELY flush contaminated skin with water for at least 15 minutes following any skin contact. For eye exposures, IMMEDIATELY flush eyes with water for at least 15 minutes. Consult SDS for guidance on appropriate first aid. Where medical attention is required, bring the SDS(s) of chemical(s) to aid medical staff in proper diagnosis and treatment.  **Chemical Spill:** Do not use vermiculite or kitty litter to absorb spilled HF. It will cause a reaction that releases toxic tetrafluoride gas. Purchase a dedicated HF spill kit that contains calcium carbonate or calcium bicarbonate.  **Evacuation Procedure**   * Immediately evacuate the building via the nearest exit when the fire alarm is activated. * If unable to evacuate due to a disability, shelter in the area of rescue / refuge, typically a stairwell landing, and wait for assistance from drill volunteers or emergency responders. * Instruct visitors and students to evacuate and assist them in locating the nearest exit. * Do not use elevators to exit the building during an evacuation as they may become inoperable. * Carry only those personal belongings that are within the immediate vicinity. * Close doors to limit the potential spread of smoke and fire. * Terminate all hazardous operations and power off equipment. * Close all hazardous materials containers. * Remain outside of the building until the building is released for reentry. * Do not restrict or impede the evacuation. * Convene in the designated grassy gathering area and await instruction from emergency responders or drill volunteers. Avoid parking lots. * Report fire alarm deficiencies, (e.g., trouble hearing the alarm) to facilities personnel for repair. * Notify evacuation drill volunteers or emergency responders of persons sheltering in the areas of rescue/ refuge. * **Never assume that an alarm is a “false alarm”. Treat all fire alarm activations as emergencies. Get out of the building!**   **Incident and Near Miss Reporting**: Report any incident that occurs in any University of South Florida affiliated teaching or research laboratory/studio or field research project. An incident means any unplanned event within the scope of a procedure that causes, or has the potential to cause, an injury or illness and/or damage to equipment, buildings, or the natural environment. Due to medical privacy concerns, no personal identifying information of the person involved in the incident shall be entered or submitted with the form.  <http://www.usf.edu/administrative-services/environmental-health-safety/reporting/index.aspx>  **Workers’ Compensation Procedure:** Call AmeriSys at 800-455-2079 to report a work-related injury or illness. Complete the Supervisor’s Accident Investigation Report available at the link above and send it to EH&S within 24 hours. | | | |
| **WASTE DISPOSAL** | | | |
| All chemical waste generated within USF System laboratories is considered hazardous waste and must be disposed of as hazardous waste in accordance with the USF Hazardous Waste Management Procedure, the U.S. EPA, and the FDEP. The USF Hazardous Waste Management Procedure can be found using the following link, <https://www.usf.edu/administrative-services/environmental-health-safety/documents/hazwaste-managementprocedure.pdf> | | | |
| **TRAINING REQUIREMENTS** | | | |
| All individuals working with chemicals in USF laboratories must take EH&S’s Laboratory Safety Training. To register for Laboratory Safety Training, please use the following link, <https://www.usf.edu/administrative-services/environmental-health-safety/training/course-descriptions.aspx#labsafety>  This procedure may warrant additional safety training per the PI, EH&S, or an authorizing unit such as the Biosafety or Radiation Safety programs. Check training requirements for this activity below:  Research Specific Training from the PI/Lab Supervisor or their designee  EH&S Laboratory Safety Training  EH&S Hazard Communication  EH&S Hazardous Waste Awareness and Handling  EH&S Respirator Fit Test  EH&S Biomedical Waste  EH&S Universal Pharmaceutical Waste Training  EH&S Fire Prevention Safety  EH&S Slips, Trips, and Falls  RIC Biosafety Core Course  RIC Shipping Biohazardous Materials  RIC BSL 3  RIC Radiation Safety  RIC Laser Safety  RIC Boating Safety  RIC Scientific Diving  Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | |
| **PRIOR APPROVALS** | | | |
| This activity requires prior approval from the PI/designee.  If this box is checked, working alone is not allowed. | | | |

By signing and dating here the Principal Investigator/ or a designee certifies that the Standard Operating Procedure (SOP) for ***Hydrofluoric Acid*** is accurate and effectively provides safe standard operating procedures for employees and students in this lab who will handle this hazardous chemical.

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Signature Printed Name Date

I affirm that I have read and understand the Standard Operating Procedure for***Hydrofluoric Acid*** and have undergone the EH&S Laboratory & Research training and any lab specific training regarding this SOP.

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| Printed Name | Signature | Date |
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