STANDARD OPERATING PROCEDURE
Safe Use of Hydrofluoric Acid (HF)

Hydrofluoric acid, a solution of hydrogen fluoride gas (HF) in water, is one of the most corrosive and dangerous chemicals encountered in the laboratory. Exposure to HF can cause severe tissue damage and even death. Deaths have been reported from concentrated acid burns (involving ≥ 50% HF solutions) to as little as 2.5% of body surface area. In lower concentrations, symptoms may be delayed. The following special safety precautions are necessary when using this chemical, regardless if using diluted or concentrated HF.

SAFETY DATA SHEET (SDS):

Review carefully the attached Safety Data Sheet (or the Safety Data Sheet on the manufacturer’s web site) before working with Hydrofluoric Acid.

CEMS:

Go to Chemical Environmental Management System (CEMS) http://cems.uta.edu to locate Hydrofluoric Acid in your laboratory.

TRAINING:

Complete online Hazard Communication and Waste Management training and receive Site Specific training from your PI/Lab Manager/Chemical Owner which includes reviewing the hazards of Hydrofluoric Acid (HF), safety precautions, and emergency procedures. Fill out the attached Site Specific training form and submit to ehsafety@uta.edu.

ENGINEERING CONTROLS AND SAFETY EQUIPMENT:

Plan the operation to eliminate risk of Hydrofluoric Acid (HF) splash/spray. Ensure the nearest emergency safety shower/eye wash is accessible and has been tested within the last 12 months. Ensure laboratory fume hood has been tested within last 12 months and is functioning properly.

FIRST AID:

Ensure 2.5% Calcium Gluconate gel (intended for dermal exposures) is available in the laboratory and not expired. It is used in responding to Hydrofluoric Acid exposure to the body, mitigating or preventing the related pain and potential tissue burns and bone damage. Calcium gluconate combines with hydrofluoric acid to neutralize the powerful fluoride ion. Familiarize yourself with FIRST AID MEASURES described in the attached Safety Data Sheet.

Remember: all HF burns or exposure should be referred to a hospital after washing and starting initial first-aid procedures with Calcium Gluconate gel.
PERSONAL PROTECTIVE EQUIPMENT (PPE):

Check PPE for damage before using. Wear appropriate PPE, which minimally includes:

- Goggles and face shield.
- Butyl rubber or neoprene gloves (consider double gloving).
- Lab coat and neoprene long-sleeve apron.
- Closed-toe shoes.

WORK PRACTICES:

- Work in the fume hood with the sash opened as little as possible.
- Purchase and use the smallest quantities of HF necessary.
- Establish designated area for HF use and post sign “Hydrofluoric Acid Use Area.” Also post sign on lab door when in use.
- Do not work alone; others present in the laboratory must be familiar with the operation’s hazards and emergency procedures.
- Add acid to water, not water to acid.
- Do not use glass, ceramic, or other incompatible containers with HF.
- Ensure secondary containment and segregation of incompatible chemicals.
- Store HF solutions below eye level.