

# Hydrofluoric Acid Guidelines

Faculty of Science – University of Ottawa

## Scope

This procedure is to be used when handling hydrofluoric acid (HF) and hydrofluoric acid mixtures.

## Hazards

- HF is non-flammable and is not carcinogenic but it is extremely corrosive
- All forms (dilute, concentrated or vapors) can cause severe burns and melting
- Concentrations of 40% or higher produce hazardous vapors
- HF burns may penetrate the skin and symptoms may be delayed up to 24 hours
- HF **MELTS GLASS SO USE ONLY PLASTIC CONTAINERS AND LAB EQUIPMENT**



## Training

All research personal are required to undergo safety and health training before working in the laboratory. They must complete an online WHMIS training and the Lab Safety Training course. For HF, researchers must also receive specific training for HF sanctioned by their Principle Investigator on how to safely use HF for their specific experiments. The training should include training on the hazards, safe handling, storage, emergency treatment and disposal of HF.

If HF comes into contact with the skin, it may burn the skin instantly or may have a delayed reaction of up to 24 hours after the contact. Each laboratory using HF must possess a tube of calcium gluconate in a clearly labeled location and a tube of calcium gluconate for the researcher to bring home. Following the usage of a tube of calcium gluconate, a replacement tube must be available and an [incident report](#) must be filled out.

## Proper use of handling hydrofluoric

### Storage

Concentrated HF should be stored in an acid cabinet in a secondary containment container made of polyethylene. Do not store HF with incompatible materials such as glass, ceramic and metals as this may produce hydrogen gas.

### Warning signage

Whenever HF is being used or is on the bench top, there must be warning signs posted on the chemical hood and the door to laboratory. Signage should include the location of use, name and contact information of user and identification of the chemical and risks involved in its use. Here is an example:

**CAUTION - HYDROFLUORIC ACID IN USE**  
**EXTERMELY CORROSIVE AND TOXIC**  
**FOR MORE INFORMATION, PLEASE CONTACT \_\_\_\_\_**  
**IN THE EVENT OF A CHEMICAL SPILL, CALL PROTECTION AT EXT. 5411**

## Personal protective equipment (PPE)

All work with HF should be done in a chemical fume hood wearing the following personal protective equipment (PPE):

- Approved wide face shield or splash-proof chemical goggles
- Protective gloves should be worn at all times. Consult other researchers using HF, manufacturers' chemical resistance guides and the MSDS/SDS of the chemical used
  - A suggestion for gloves would be long vinyl or gloves
  - Gloves are to be inspected prior to and during use
  - Use proper glove removal technique
  - Dispose of used gloves ONLY in provided waste disposal container
- A neoprene, nitrile, or rubber apron

## Handling

1. All operations involving HF must be conducted in a chemical fume hood
2. A secondary containment made of plastic is suggested to contain any potential spills
3. Personal Protective Equipment (PPE) must ALWAYS be worn when handling HF
4. NEVER work with HF alone. There should always be a second person both aware of the dangers of HF and in the laboratory if any emergencies should arise. If you are working after hours, follow the [After Hours Policy](#) outlined by the University of Ottawa

## Accidental release/spills

If at any point there is a spill and the operator believes their safety is in danger, contact Protection at ext. 5411 immediately.

- If HF is spilled outside the fume hood or there is a large spill in the fume hood:
  1. Evacuate the area immediately
  2. Close the doors
  3. Place signage on the doors of the hazardous material
  4. Ensure that no one else enters the lab
  5. Contact Protection (ext. 5411) from a nearby land line if possible
  6. Wait for Protection to arrive
  7. Continue with the regular [Spill Response Procedures](#)
- If a small amount of HF is spilled in the fume hood and the laboratory staff understand the hazards and feel comfortable mitigating the spill:
  1. Ensure that the correct PPE is worn
  2. Inspect gloves for deficiencies
  3. Sprinkle sodium bicarbonate or a spill absorbent specific for HF on the spill
    - DO NOT USE A NON-SPECIFIC SPILL KIT WHILE CLEANING THIS SPILL AS HF WILL REACT WITH THE SILICA TO PRODUCE A TOXIC GAS
  4. With a brush and dustpan, sweep the powder and place the powder into a plastic bag
  5. Dispose of the brush and dustpan in the bag and seal the bag
  6. Contact the HSR Team for disposal of the chemical waste

## First aid and security measures

Burns from small amounts of HF can be lethal and the reaction may be delayed up to 24 hours. Operators and their colleagues using HF should be informed on the first aid measures in place and the location of the HF emergency kit.

All labs containing concentrated HF must have the following in their HF emergency kit:

- A tube of calcium gluconate
- 1 pair of nitrile gloves for applying the gel
- An MSDS or SDS that is no less than 3 years old for medical/emergency personnel
- A sheet with laboratory contact names and telephone numbers
- The address and directions to the nearest hospital

### In case of skin contact

1. Wash affected area under running water for at least 5 minutes
  - a. if the spill is on the body, use the emergency shower
2. Remove any contaminated clothing or gloves
3. Put on a pair of gloves and apply a generous amount of calcium gluconate to the area
4. Reapply every 15 minutes and massage continuously
5. With the printed MSDS in hand, seek immediate medical attention at a hospital

### In case of eye contact

1. Wash with copious amounts of water for at least 15 minutes while holding eyelids apart
2. With the printed MSDS in hand, seek immediate medical attention at a hospital

### For ingested and inhaled HF vapors

1. Remove the individual from the affected area
2. With the printed MSDS in hand, seek immediate medical attention at a hospital

## Resources

- [Faculty of Science HSR Website](#)
- [ORM Website](#)
- [Biosafety Office](#)
- [Incident Report](#)
- [MSDS for HF](#)
- [Hazardous Waste Procedures](#)

Questions? Contact the HSR Team at [pbera@uottawa.ca](mailto:pbera@uottawa.ca) or extension 6425