Hydrofluoric Acid (HF) Safety

Hydrofluoric Acid (HF) is one of the most dangerous chemicals known. Exposures to HF can be fatal if not treated properly. Contact with HF in concentrations less than 48% does not cause immediate pain, so systemic poisoning can begin before the person is aware of their contact with the acid. The critical minutes following an exposure can have a great effect on the chances of a victim’s survival.

HF, commonly found in 48% concentration, is a weak inorganic acid. It is primarily used as an etching agent and in the production of organofluorine and fluorides compounds. It is a clear, colorless liquid that is known for its distinct ability to dissolve glass. Despite being a weak acid, its corrosive property is a secondary concern in comparison to its toxic hazard. Upon exposure, it absorbs through the skin and binds to calcium in the blood, bones and other organs causing tissue death, hypocalcemia that can result in cardiac arrest.

First Aid & Emergency

Call 9-911 immediately! Use the guide below until medical help arrives.

Skin Contact: Flush with large amount of water for 5 minutes (not 15 minutes) while sending someone to call 9-911. Remove all contaminated clothing. Using gloves, apply 2.5 calcium gluconate gel to the affected area. This may be repeated over hours or even days.

Eye Contact: Flush the eyes for at least 15 minutes with large amounts of water. A sterile 1% calcium gluconate solution may be used if available after 5 minutes of flushing with water.

Inhalation: Medical personnel should administer a nebulizer solution of 2.5% calcium gluconate.

Ingestion: Have the victim drink large amount of water as quickly as possible. Do not induce vomiting. If available, give several glasses of milk or several ounces of Maalox, Mylanta, or administer a few Tums antacid tablets.

Safe Work Practices

Before beginning work involving HF, calcium gluconate gel must be available and located in the laboratory area. This gel must be inspected before each use of HF or at least monthly to ensure the gel has not been removed nor reached its expiration date. Laboratories which keep or use HF should have emergency procedures on hand as well as an SDS.
Handling Hydrofluoric Acid: All personnel using HF must be aware of its hazards and must be trained

1. Familiarize yourself with HF hazards by reviewing the SDS and lab specific SOP. EH&S recommends that these documents be posted near HF designated work area.
2. HF should never be handled by anyone who has not been trained to use it.
3. Always handle HF in:
   a. A properly functioning fume hood
   b. An area equipped with a Safety Shower/Eye Wash.

4. Personal Protective Equipment (PPE) for HF use:
   a. Goggles
   b. Face shield (plastic)
   c. Gloves: heavy neoprene, butyl or silver shield over nitrile gloves
   d. Acid resistant apron
   e. Plastic arm coverings
   f. Long pants, sleeves, and closed toe shoes
5. Wash gloves off with water before removing them.
6. Never work alone with HF!!!

HF Storage & Disposal

HF and its waste must be stored in a chemically compatible container (e.g. polyethylene or Teflon®) and properly labeled. Collect your HF liquid waste in a plastic container with a lid and HF solid waste (e.g. pipettes etc.) in a plastic bag. Tag and dispose HF waste via OTP system.