



Hydrofluoric Acid

Hydrofluoric acid (HF) is an extremely corrosive acid used for many purposes including mineral digestion, surface cleaning, etching, and biological staining. HF's unique properties make it significantly more hazardous than many of the other acids used on campus. This fact sheet discusses how to protect yourself against the dangers of HF. Attached you'll also find emergency procedures for dealing with HF exposures. Please post these procedures or HF exposure kit poster wherever HF is used or handled.

Health Hazards

The health hazards of HF are dependent upon the type of exposure and the concentration of HF.

or greater) immediately results in serious injury. Skin contact with HF (even at low concentrations) can cause severe burns, but systemic fluoride poisoning can occur if the acid is absorbed through the skin.

One of the most insidious hazards of HF is that skin contact at lower concentrations may not cause pain until hours after the exposure. Because of HF's ability to penetrate skin without necessarily causing pain, all skin, eye, or tissue contact with HF requires immediate first aid and medical evaluation, even if the injury appears to be minor.

Exposure to HF can also affect the lungs. Delayed reactions up to and including fatal pulmonary edema (swelling of the lungs with body fluids) may not be apparent for hours after exposure. Employees' exposure to airborne concentrations of HF to an extent that is considered a health hazard over an 8-hour work day. Airborne concentrations of 10 to 100 ppm are considered hazardous to the respiratory tract.

EMERGENCY RESPONSE PROCEDURES
FOR HF EXPOSURE:

Skin Exposure:

Immediately washing off the acid is a priority!

1. Immediately wash all affected areas with water. While flushing with water, remove all clothing or jewelry that could trap HF. (Remove goggles last, close eyes, face water flow and pull goggles over head.)
2. While the victim is being rinsed with water, someone should call ODU Police at **683-4000** provide the following information to the dispatcher:
 - a. There is a person that has been exposed to hydrofluoric acid.
 - b. The person can be found at [give location of victim].
 - c. Please send an ambulance or arrange transportation.
3. Rinsing may be limited to 5 minutes if Calgonate® Gel is available. If 2.5% calcium gluconate gel is not available, continue flushing with water for at least 15 minutes or until medical treatment is given.
4. Apply Calgonate® Gel freely and massage it into the affected site. Apply the gel as soon as the washing is done. Affected area does not need to be dried prior to application. After these actions have begun, the victim should be re-examined to ensure no exposure / burn sites have been overlooked.
5. Calgonate® 2.5% Calcium Gluconate Gel should be reapplied continually every 10-15 minutes and massaged into the skin until the ambulance arrives or medical treatment is

Eye Exposure:

Because HF penetrates deep into tissue, exposure of hydrofluoric acid solution or vapor to the eye can produce more extensive damage than other acids in similar concentrations. For example, hydrochloric acid damages the superficial structures of the eye, but its penetration is generally limited by a precipitated protein barrier. HF is not blocked by that same natural barrier. Immediate action is critical.

1. Immediately flush eyes for at least 5 minutes with cool flowing water. Hold the eyelids open and away from the eye during irrigation to allow thorough flushing of the eyes. If sterile 1% calcium gluconate solution is available, washing may be limited to 5 minutes, after which the 1% calcium gluconate solution should be used repeatedly to irrigate the eye.
2. Immediately take the victim to a doctor, preferably an eye specialist. Clean water, eyewash, 1% calcium gluconate solution, or ice water compresses should be used to continue to irrigate the eye(s) while transporting the victim.

Inhalation:

If a large volume of hydrofluoric acid gas is inhaled:

1. Immediately move the victim to fresh air and get medical attention.
- 2.

Ingestion:

1. Have the victim drink large amounts of water as quickly as possible to dilute the acid. **Do not induce vomiting.** Do not give emetics (vomit inducing agents) or baking soda.

Never give anything by mouth to an unconscious person.

2. Drink several glasses of milk or several ounces of Milk of Magnesia, Mylanta, Maalox or similar product, or eat up to 30 Tums, Caltrate or other antacid tablet. The calcium or magnesium in these compounds may act as an antidote.
3. Seek immediate medical attention.