

Focus Sheet | Hydrofluoric Acid

How to safely store and use hydrofluoric acid and how to respond to exposures.

Health hazards of hydrofluoric acid

Hydrofluoric acid (HF) is significantly more hazardous than many of the other acids used on campus.

HF is corrosive and destroys tissue even in dilute forms. It readily penetrates human skin, allowing it to destroy tissues and decalcify bone. Skin exposure to highly concentrated HF (48% or greater) immediately results in serious and painful destruction of tissue. Exposure to concentrated HF can be fatal if the exposure covers over 2% of the body (approximately eight square inches of skin.) It reacts with the calcium in blood, which affects heart function. Skin contact with HF at lower concentrations may not produce pain until hours after the exposure. Because of this, all skin, eye, or tissue contact with HF should receive immediate first aid and medical evaluation even if no pain is felt.

HF exposure to the eyes may result in blindness or permanent eye damage.

HF vapors can seriously damage the lungs. Pulmonary edema (flooding of the lungs with fluids) may not be apparent for hours after the initial exposure. Airborne exposures above 50 parts per million can be fatal.

Long term or chronic exposure to HF may result in fluorosis, a syndrome characterized by weight loss, brittle bones, anemia, and general ill health.

Safe use

If possible, avoid working alone when using HF. Ensure everyone in your work area is trained on HF and first aid measures. Follow standard operating procedures. Do not eat, smoke, or drink where HF is handled.

Never wear shorts or open-toed shoes. To protect your eyes and face, always use chemical goggles together with a face shield when handling HF. Wear a laboratory coat with a chemical splash apron made out of natural rubber, neoprene or viton. When working with HF, consider double gloving using a SilverShield glove with a nitrile outer glove to improve dexterity. Don't reuse the gloves. Latex exam gloves will not protect you from HF. If gloves become contaminated with HF, remove them immediately, thoroughly wash your hands, and check your hands for any sign of contamination. Gloves contaminated with HF must be disposed of as hazardous waste.



Focus Sheet | Hydrofluoric Acid

Use HF with adequate ventilation to minimize inhalation of vapor. HF in concentrations of greater than 5% should always be handled inside a properly functioning fume hood.

Storage

Store HF in labeled, chemically compatible containers (polyethylene or Teflon). Glass, metal and ceramic containers are not compatible with HF. Don't store HF near incompatible chemicals such as ammonia or other alkaline materials. If possible store HF in a polyethylene tub and carry it using a bottle carrier.

Emergency procedures

In the event of skin contact with HF use the safety shower. Remove clothing while in the shower being careful not to spread contamination to other skin areas. Double glove using SilverShield and Nitrile gloves. Then, apply calcium gluconate gel to the affected area. Massage it into the skin. White specks in the contaminated area indicate that the reaction of calcium and fluoride is taking place. If the gel clouds or separates, then reapply the gel. Call 911 as soon as possible. Reapply calcium gluconate gel every 15 minutes until medical assistance arrives. If calcium gluconate gel isn't available, wash area with water for at least 15 minutes and call 911. Calcium gluconate gel is manufactured by the Calgonate Corporation and sold in 25 g tubes with a two year shelf life.

In the event of eye contact, use the eyewash for 15 minutes. Do not apply calcium gluconate in the eyes. Call 911.

If HF is inhaled, call 911. Move the exposed person to fresh air and wait for medical assistance.

In all cases, it is helpful to give written information such as an HF MSDS or this focus sheet to emergency personnel. HF is not a common chemical and can be easily confused with other acids that are not as hazardous.

Cleaning up spills

If safe to do so, absorb small spills using spill pads. UW Multipurpose Spill Kits contain gloves, goggles and universal spill pads. Calcium carbonate or calcium hydroxide may be used in some instances to neutralize spills.

A concentrated HF spill outside of the fume hood is very dangerous. Evacuate the area, close all doors to the area and post signs to prevent others from entering. Call EH&S during business hours at 206.543.0467 to arrange for a contractor to clean up the spill. Call 911 after business hours.

Disposal

Manage HF and all HF-contaminated spill debris as a hazardous waste.



Environmental Health and Safety
Environmental Programs
201 Hall Health Center Box 354400
Seattle, Washington 98195-4400
206.616.5835 FAX 206.685.2915
www.ehs.washington.edu

