



## UNIVERSITY OF CALGARY

Department of Geoscience

### **Hydrofluoric Acid Policy**

Hydrofluoric acid (HF) is extremely irritating and corrosive to skin and mucous membranes. It also has an affinity for calcium and is attracted through the skin tissues towards the bone, and thus causes extensive done damage as well as skin burns. Inhalation of vapours may cause ulcers of the upper respiratory tract. Concentrations at 50 to 250 ppm are dangerous, even for brief exposures. HF produces severe skin burns which are slow in healing. The threshold limit is 3ppm in air.

HF will not burn, and is normally stable, and is not reactive with water.

Policy:

- The use of HF is restricted to normal working hours of the department - 08:30 - 16:30, Monday to Friday.
- Before using HF, you must advise your Grad Supervisor, the lab's Principle Researcher, if not your grad advisor, the Technician-in-Charge of the lab, or the Technical Supervisor.
- Be sure to leave lab doors open when working with HF, so that if you need help, someone can hear you.
- HF must be used in a fume hood, in a lab equipped with an eye wash and safety shower.
- HF spill kits and treatment kits must be immediately available when HF is being used. (Standard acid spill kits are not acceptable for HF clean up.)
- The following protective clothing must be worn:
  - ✓ inner gloves
  - ✓ outer gloves
  - ✓ lab coat
  - ✓ liquid resistant apron
  - ✓ face shield and safety glasses
- Legs and feet must be completely covered - no shorts or open shoes.
- HF must not be left in open containers, plastic ware or wash bottles.
- HF must be neutralized before disposal. After neutralization (with limestone chips or shell chips), the remaining residue to be sent to the Safety Office as mixed chemical waste. Under no circumstances will HF residue be left in an open topped container

### **Emergency Protocols:**

Any contact with HF is serious and requires immediate attention. Emergency medical attention should be considered in all cases.

Skin: Persons who have had contact with HF should be showered immediately under an emergency shower. Contaminated clothing should be removed as rapidly as possible, while the victim is in the shower. This should be done at the site of the accident. It is important that the

exposed area be washed with copious quantities of water for a sufficient period of time to remove all the HF. This is done until the burned skin resumes its normal colour (at least 10 minutes). HF burn protocol may include antidote-style neutralizing cream.

**Eyes:** When liquid HF has entered the eyes or if the eyes have been exposed to high concentrations of HF vapour, they should be flushed with large quantities of water for at least 15 minutes. The eyelids should be held apart during the irrigation to ensure the water will flush all the tissue surfaces of the eyes and lids. Ice compresses should be applied intermittently when not irrigating the eyes. The injured person must get medical treatment.

**Fume Inhalation:** High concentration of fumes in the respiratory tract may cause burns more critical than those on exposed parts. Immediately remove the person to an uncontaminated area. **CALL FOR EMERGENCY ASSISTANCE.** To prevent the development of severe lung congestion, 100% oxygen inhalation should be started as soon as possible, this can be done only by qualified personnel. Oxygen inhalation must be continued as necessary to maintain the normal colour of the skin and mucous membranes. The affected person should receive medical attention as soon as possible.

It is also worth noting that burns from dilute solutions of HF acid are different from those of concentrated solutions. The main difference is that they have a long latent period before they become painful. This delay may cause personnel to feel first aid treatment is not necessary for a splash of dilute acid. Every HF contact, regardless of concentration, is serious and must invoke treatment.

In most burn cases, an ambulance should be called and the injured person transported to the hospital for medical treatment.

Every precaution must be taken to ensure that HF droplets are not spread by splashes or hand through labs, to hood counters, sink taps etc. Do this by rinsing outer gloves in a previously filled bucket of water.

HF contaminated items such as paper towels and gloves must not go into the garbage, treat them as hazardous waste.

All HF spills are to be reported to Safety Services and the Technical Supervisor.