

WAYNE STATE UNIVERSITY

Safety Talk - Hydrofluoric Acid (HF)

Date: _____

Trainer: _____

HF is a highly corrosive solution of hydrogen fluoride. It can penetrate skin, destroy soft tissues, and decalcify bones. When working with HF, it is important to establish and frequently review safety procedures. **Seek immediate medical assistance (WSU PD 7-2222) for anyone exposed to HF.**

Skin or eye exposure to liquid or vapor can cause severe burns. HF penetrates the skin and attacks underlying tissues. Large or multiple burns greater than 25 sq. in. of body surface area may be fatal. Prolonged contact to very dilute HF solutions can cause burns; symptoms may be delayed:

- HF concentrations greater than 50%: Immediate burns, rapid destruction of tissue beginning as a whitish discoloration, usually progressing to blisters, accompanied by severe pain.
- HF concentrations between 20% and 50%: Symptoms can be delayed up to eight hours.
- HF concentrations less than 20%: Symptoms may be delayed up to 24 hours.
- HF concentrations as low as 2%: If exposure is prolonged enough, symptoms can appear.

Inhalation: Severe exposure can cause nose and throat burns, lung inflammation, pulmonary edema, and other toxic effects including hypocalcemia which, if not treated properly, can be fatal. Mild exposure can irritate the nose, throat and respiratory system; symptoms may be delayed for several hours.

Ingestion can cause severe burns to the mouth, throat and stomach and may result in death if swallowed. Even ingesting small amounts of dilute HF will likely cause profound and possibly fatal hypocalcemia and systemic toxicity unless medical treatment is immediately initiated.

Spills: Help prevent spills by maintaining a supply as small as possible and promptly disposing of unwanted hydrofluoric acid. Keep a hydrofluoric acid spill kit nearby, containing personal protection gear (gloves, goggles, shoe covers, etc.) spill containment, cleanup, and disposal items. Calcium carbonate or calcium hydroxide should also be kept near where the work will be conducted. If more than 100 ml is spilled, or if the HF is concentrated, contain the spill as much as possible, evacuate the area, and call WSU Police (7-2222) and OEHS (7-1200). Avoid exposure to vapors. If a small quantity (100 ml or less) of dilute HF solution is spilled, clean it up by using powdered calcium carbonate or calcium hydroxide.

Protective Measures

- Inform all users about the hazards and procedures for use and disposal.
- Inform everyone working in the area of the hazards of HF and emergency and first aid procedures.
- Only those familiar with the hazards should handle concentrated HF. Avoid working alone with HF.

Personal protective equipment (PPE) required when working with HF solutions (especially >1%):

- Goggles and a face shield.
- Long-sleeved, buttoned lab coat; pants or long skirt; and closed-toe shoes.
- Neoprene or nitrile (22mil) or other hydrofluoric acid resistant gloves (HF burns around the fingernails are extremely painful, difficult to treat, and may require surgical removal of the nail).
- A chemical resistant apron is also recommended.

First Aid - Call WSU PD (7-2222) immediately: request an ambulance for anyone exposed to HF.

Skin Exposure - In order to prevent cross contamination, the victim should perform the following actions on him/herself (others may help but they must be careful not to contaminate themselves by wearing HF-protective gloves and other safety equipment): Immediately wash acid off all affected areas with water. While flushing with water, remove all clothing or jewelry that could trap HF (remove goggles last: close eyes, face the water flow and pull goggles over head). If 2.5% calcium gluconate gel is not available, continue flushing with water until medical assistance arrives. Rinsing may be limited to 5 minutes if 2.5% calcium gluconate gel is available: apply gel freely and massage it into the affected site as soon as the washing is done; the affected areas don't need to be dried prior to application. Reexamine the victim for any

