SAFE USE OF HYDROFLUORIC ACID

Hydrofluoric acid, a solution of hydrogen fluoride gas (HF) in water, has a number of chemical, toxicological and physiological properties that make handling this material especially difficult. Fluoride ion toxicity and its ability to move through the body make immediate first aid for HF exposure essential.

Chemical & Toxicological Properties

- HF dissolves glass, glazes, enamels, pottery, concrete, rubber, leather, and many metals and organic compounds
- May form explosive hydrogen gas when reacting with metals (use and store in polyethylene, teflon, wax, or passivated steel vessels)
- Chronic exposure to fluoride, including fluoride-containing compounds other than HF, can cause tooth mottling and increased bone density
- Fluoride ions are acutely and chronically toxic. Acute effects of exposure to concentrated (>20%) HF include respiratory irritation, severe eye damage, and pulmonary edema. Exposure to less concentrated solutions may have equally serious but delayed effects
- HF is chemically defined as a “weak” acid, but can cause severe tissue damage or death

Physiological Properties

- If you can smell it, the concentration is too high and immediate steps must be taken to lower it (causes irritation of mucous membranes)
- Ions migrate through the body destroying tissue until reaching the bones (if exposed to hydrofluoric acid, seek immediate medical attention even if pain is not present)

Procedures for Safe Hydrofluoric Acid Use

- Labs that keep or use HF gas or solutions should have a first aid kit containing 2.5% calcium gluconate gel for use in emergencies (contact the Campus Health Center pharmacy at 827-3926)
- Before beginning any procedure involving HF, make sure the nearest safety shower and eyewash is accessible and in proper working condition
- When working with HF or concentrated HF solutions (>1%), use/ store only in non-glass containers, work in fume hood with the sash closed as much as possible, wear goggles and a face shield, lab coat, pants/ long skirt, closed-toe shoes, PVC or neoprene gloves
- If HF vapor may be produced in processes, ensure fume hood doesn’t have a glass sash
- All lab personnel, not just those using HF, must be informed of the dangers of this chemical and proper first aid procedures

Visit [www.ehs.ucr.edu](http://www.ehs.ucr.edu) for additional information or call EH&S at 827-5528 if you have any questions.