Hydrofluoric Acid Use Policy
School of Chemical Sciences
University of Illinois at Urbana-Champaign

Hydrofluoric acid (HF) is an extremely corrosive liquid and vapor with a pungent, irritating odor that can cause severe injury via skin and eye contact, inhalation, or ingestion. HF is extremely corrosive to all tissues of the body. Skin contact with HF results in deep, painful burns that are slow to heal. It is important to seek medical attention if contact with HF is even suspected, as burns from dilute (<50%) HF do not usually become apparent until several hours after exposure. Concentrated HF can cause burns that are immediately painful. HF is extremely hazardous at ANY concentration. ALL HF ACID EXPOSURES SHOULD BE CONSIDERED A MEDICAL EMERGENCY.

HF poses unique dangers distinct from other acids (HCl, H₂SO₄, etc.) due to the fact that HF readily absorbs through the skin, which damages underlying tissue, and ultimately leads to decalcification of the bones. HF and HF vapor can also cause severe burns to the eyes, which can lead to permanent damage or blindness. HF can also irritate/damage the respiratory tract, mouth, throat, or gastrointestinal tract if inhaled or ingested. These routes of entry into the body can ultimately be fatal.

The best way to avoid hazards involving HF is to find a less hazardous substitute. Consult your PI, colleagues, reference sources, and/or SCS Safety Personnel for substitution assistance. Remember, you are ultimately responsible for your own safety. It is your responsibility to put the following policy into practice.

Storage:

- HF should always be stored in polyethylene containers. HF will etch through glass bottles and reacts with some metals.

- Containers of HF should be stored in secondary containers made of polyethylene away from incompatible materials.

- Laboratories should store no more than 4L of HF at any time. Larger quantities should be approved by SCS Safety Personnel.

Handling:

- Proper Personal Protective Equipment should be worn at all times when working with HF. Proper PPE includes: gloves, goggles, lab coats, and proper laboratory attire (long pants, closed toed shoes, etc.). Refer to the School of Chemical Sciences Chemical Hygiene Plan for further PPE information. Two pairs of gloves or thicker gloves should be used when dealing with HF. However, the user should ensure that dexterity is not compromised when wearing multiple pairs or thicker gloves. Due to the ability of HF to

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absorb through the skin, long sleeves and/or a lab coat should be worn when handling HF. Contact SCS Safety Personnel for PPE selection advice.

- All work with HF should be done in a fume hood to prevent exposure by inhalation.
- Anhydrous HF is one of the strongest acids known and work with anhydrous HF should only be conducted with special equipment and only by well-trained personnel familiar with HF hazards and first aid procedures.

General Use:

- Before working with HF the user should check to ensure that their laboratory fume hood is functioning properly (correct face velocity as indicated by DRS hood velocity labels, well lit, etc.).
- Work with HF should be done in the smallest possible area in the laboratory. Use only one fume hood if possible. The hood should be labeled: HF in use in this area

Waste Disposal:

- Excess HF and HF contaminated debris should be placed in a polyethylene container, labeled and disposed of according to the UIUC Chemical Waste Management Guide. Contact SCS Safety Personnel if you are unsure of proper waste disposal procedures.

First Aid and Treatment:

- Personnel working with HF should be familiar with first aid procedures prior to working with HF.
- **It is mandatory that all laboratories working with HF have Calcium Gluconate Gel available in the laboratory.** Periodically check the expiration date of the calcium gluconate gel to ensure that the gel has not expired. Upon opening and initial use, the calcium gluconate gel must be discarded. Calcium Gluconate Gel is available for purchase in the SCS Storeroom.
- It is highly recommended that all laboratories working with HF have a readily accessible HF burn kit in the laboratory. Contact SCS Safety Personnel for assistance in purchasing an appropriate kit.
- **ALL groups working with HF should have an HF spill kit in the laboratory.** This spill kit should include: 2 pair heavy duty chemical resistant gloves, 1 pair chemical splash goggles, 4 polyethylene bags (24” x 24”, 4 mil thickness), 4 zip ties, 4 3M brand P-110 Chemical Sorbent Pads. All spill kit components are available in the SCS Storeroom. Spill kits are also available in the corridors of RAL and CLSL-A. In addition, sodium bicarbonate can be used to effectively clean up HF spills.
• If HF poisoning is suspected, call 9-911 IMMEDIATELY from campus phones or 911 from all other phones.

• First aid should be started immediately in the event of contact with HF. If HF has come in contact with the skin, the area should be flushed with copious amounts of water for 15 minutes. Calcium Gluconate Gel should be applied after rinsing with water. Medical care should be sought even if no pain is present, as HF can penetrate through the skin and damage underlying tissue and can cause decalcification of the bones.

• Upon contact with the eyes, the eyes should be flushed and medical attention should be sought immediately. If HF is ingested or inhaled seek medical attention immediately and remove the person from the site of exposure if it is safe for the rescuer to do so.

**If HF exposure is even suspected, call 9-911 from campus phones or 911 from all other phones. Be conservative in your HF exposure evaluation. When in doubt, call 9-911 or 911.**

If you have further questions concerning HF contact SCS Safety Personnel or Division of Research Safety.