Laboratory Safety Standard Operating Procedure (SOP)
(for the use of hazardous materials or equipment)

NAME OF PROCEDURE: HYDROFLUORIC ACID

PREPARED BY: RACHAEL MATTHEWS **REVISION DATE: 07/16/2018**

BRIEF DESCRIPTION OF PROCEDURE: 100 words or less, mass balanced equation, quantity limits

HF is commonly used to etch glass or remove silyl protecting groups due to the strong affinity between fluoride and silicon.

LOCATION – This procedure may be performed at the following location(s):

Do not store HF cylinders for extended period of time due to the over pressure hazard of carbon streel containers. HF reacts with the iron steel which builds pressure in the container. Store in a cold dry place away from acetic anhydride, alkalis, ammonia, arsenic trioxide, calcium oxide, carbonates, concrete, cyanides, ethylene diamine, fluorine, leather, organic materials, phosphorus pentoxide, rubber, strong bases, sulfides, sulfuric acid, and vinyl acetate.

HAZARDS – The materials and equipment associated with this procedure present the following exposure or physical health hazards. Safety precautions are prudent and mandatory (SDS of all chemicals referenced):

Even minimal exposure can lead to death. Contact emergency services even if you do not feel pain.
Skin
Exposure should be flushed with water then treated with Calcium Gluconate cream and reapply every 10-15 min. while contacting emergency services 216-368-3333. High exposure are corrosive to tissue and cause severe burns.
Inhalation
Corrosive to tissues and penetrates mucous membranes. Swelling or symptoms may be present for up to 24 hours, removal to fresh air and contacting EHS.
Swallowing
Damage to the esophagus and stomach. Results are gradual and lingering narrowing of the esophagus.
Eye
Prolonged or permanent visual defects, blindness, or total destruction of the eye. The fumes can dry out the eyes causing a burning sensation, redness, and secretions.

ENGINEERING CONTROLS – Prior to performing this procedure, the following safety equipment or device features must be available and ready for use (e.g., chemical fume hood, glove box, gas cabinet, pressure-relief valve, automatic shut-off, intrinsically safe hot plate) **(specialized equipment SOP may be referenced):**

No other procedures should be done in the fume hood until all HF work is complete, the waste collected, and equipment and materials have been cleaned and properly discarded or removed from the area.
HF should be stored in a plastic container away from all incompatible materials**.**

You must have prior written approval from Professor Pentzer before working with HF. Undergraduate students are not to use HF under any circumstances.

ADMINISTRATIVE CONTROLS – This procedure requires the following training (e.g., pyrophorics and isocyanates handling, corrosive gas techniques)**, special techniques** (e.g., use spatula when weighing powder, warm cryogenically cooled material in stages)**, work practices** (e.g., attended operation only, working alone prohibited, notify lab occupants)**, and warning devices** (e.g., toxic gas detection, smoke detectors) respiratory use training**:**

All people in the work area should be notified when HF is in use. Working alone is prohibited. Calcium Gluconate cream should be stored in the first aid kit

PROTECTIVE EQUIPMENT – Prior to performing this procedure, the following personal protective equipment must be obtained and ready for use (safety eyewear, resistant gloves (specify manufacturer and thickness), lab coat, chemical splash apron, closed toed shoes, long pants, additional respiratory protection needed)

Gloves such as laminate, nitrile, neoprene, natural rubber, and butyl gloves protect HF 48% solution. Refer to the glove chart for concentrations greater than 48% HF in solution. All work must be conducted in the hood with at minimum a lab coat, goggles, and nitrile gloves.

WASTE DISPOSAL – This procedure will result in the follow regulated waste which must be disposed of in compliance with environmental regulations:

Small concentrations can be added to a base bath in polyethylene or Teflon to neutralize any acid that is left over. Larger volumes should be placed in tightly sealed plastic containers and appropriately labeled hazardous waste.

ACCIDENTAL SPILL – In the event that a hazardous material spills during this procedure, be prepared to execute the following emergency procedure:

Small spills
Neutralize the area as quickly as possible with calcium carbonate.
Large spills
Close off the area immediately call EHS.

PRIOR APPROVAL – This procedure is considered hazardous enough to warrant prior approval from the Principal Investigator.

- YES - **- NO –**

CERTIFICATION – I have read and understand the above SOP. I agree to contact my Supervisor or Lab Manager if I plan to modify this procedure.

Signature **Name (Print)** **Date** **Building & Room #**