Tissue and cellular damage can occur through inhalation, skin absorption, and ingestion.

Inhalation exposure can cause extreme irritation of the respiratory tract and mucous membranes. Symptoms include lacrimation, coughing, labored breathing, and excessive sputum production. Extreme inhalation exposure can cause chemical pneumonitis and pulmonary edema, which could be fatal.

Skin absorption occurs rapidly and causes both surface burns and deep tissue damage. High concentrations of HF produce damage that is painful and can be felt immediately. More dilute concentrations cause damage, but the pain may be delayed (up to a 24-hour delay).

Concentrations of 20-50% may not produce signs of injury or symptoms for 1-8 hours. Concentrations less than 20% may not be seen for 24 hours.

Eye exposure to just the fumes of HF can cause stinging, burning, redness, dryness, and increased secretions from the eyes. Splashing of the chemical in the eyes can cause burns to the tissue which are irreversible and can ultimately result in blindness.

Ingestion can lead to severe burns to the mouth, esophagus, and stomach.

HF, because of its penetrating ability, has the potential to cause systemic damage, including the bones of the skeletal system.

Burns that are larger than 25 square inches could result in serious systemic toxicity.

Fluorine ions can readily bind to calcium, potassium, and magnesium, which causes this systemic toxicity to occur.

The binding of fluoride ions to potassium and magnesium can cause hyperkalemia (high potassium levels) and hypomagnesemia (low magnesium levels), respectively. The binding of fluoride ions to calcium (a very important nutrient in heart and muscle function), can cause hypocalcemia to occur. These conditions can cause the malfunction of internal organs, including the heart, which can result in arrhythmias, heart failure, and ultimately death.

No employee shall be exposed to HF above the permissible limit for the specified period of time. The OSHA permissible exposure limit (PEL) is 3.0 parts per million (ppm) as an 8-hour time weighted average (TWA).

suspected, change gloves immediately and discard as HF waste. Always wash your hands after wearing gloves and between changing gloves.

Use a less dangerous product than HF if possible.

Always transfer the chemical from one container to another inside of the fume hood. When transferring the chemical from one container to another, only pour the amount that is needed. Always use plastic (polyethylene) containers, as HF dissolves glass. Keep all containers of HF closed as much as possible. This chemical produces caustic vapors, and open containers will result in the release of harmful vapors.

Once work is complete, don the appropriate PPE, and wipe down the work area with a sodium bicarbonate solution. Discard all materials used in the decontamination as HF chemical waste.

HF is incompatible with glass, concrete, metals, water, other acids, oxidizers, reducers, alkalis, combustibles, organics, and ceramics. Store it away from these materials.

HF must always be stored in polyethylene (plastic) containers. HF dissolves glass: therefore, storing it in glass containers will lead to an HF spill, which has the potential to degrade other glass containers, causing subsequent spills and potentially hazardous reactions.

## Skin Exposure

If HF has been spilled on the skin or clothing, immediately remove clothing, and wash the affected area with large amounts of water, using a safety shower, sink, or another water source. With HF, time is of the essence; therefore, wash quickly and thoroughly for <u>at least</u> 15 minutes.

Dial 5555 for emergency response. While waiting for emergency responders, apply 2.5% calcium gluconate to the affected area.

If you are assisting the exposed individual, ensure that you are wearing splash goggles, a lab coat, and the appropriate gloves to avoid being exposed.

If calcium gluconate is not available, continue washing the affected area until the emergency responders arrive.

Ensure that a copy of the SDS is available for the emergency responders.

## Eye Exposure

If exposure to the eyes has occurred, immediately flush affected eye(s) for <u>at least</u> 15 minutes without stopping. Hold upper and lower eyelids open and away from the eyes during irrigation. Do not allow victim to rub eyes or keep eyes closed.

If contact lenses were being worn, remove them if possible. (Note: contact lenses should not be worn when working with this material).

Ensure that a copy of the SDS is available for the emergency responders.

Ingestion Exposure

If HF is ingested, do not induce vomiting, ingest emetics, or baking soda.

- o Extension 6666, or 470-578-6666 (Kennesaw Campus) or
- o Extension 5555, or 678-915-5555 (Marietta Campus)

While waiting for emergency responders, drink large amounts of water or milk as quickly as possible. This will dilute the acid. If you are assisting and the exposed individual is unconscious, do not administer anything by mouth.

If medical attention must be delayed, drink several ounces of milk of magnesia or other antacids.

Note: All HF exposure requires immediate first aid and medical treatment. Prompt first aid is essential, even if the victim does not exhibit any signs or symptoms or feel any pain.

Hydrofluoric Acid is considered a particularly hazardous substance (PHS) due to its corrosivity, toxicity, and its ability to quickly penetrate deep under the skin where it can cause damage to tissue and major organs. To manage risks associated with use of Hydrofluoric Acid