



EHS Fact Sheet

Hydrofluoric Acid (HF)

Introduction

Hydrofluoric acid (or HF) is an inorganic acid derived from dissolving hydrogen fluoride gas in water. It has numerous applications in industry, including organofluorine compound production, oil refining, and glassware etching. Hydrofluoric acid is colorless and fuming, producing irritating odors with a permissible exposure limit (PEL) of 3 parts per million in air. In comparison to other mineral acids, it is relatively weak, but due to the aggressive atomic properties of the fluoride ions, it is extremely hazardous. The fluoride ion has a high affinity for calcium in the human body, and exposure could lead to a condition called hypocalcemia. Additionally, it is highly corrosive, causing necrosis of subcutaneous tissue which may become gangrenous.

Safety Precautions

Before anyone uses HF, it is important to read the relevant safety data sheet and notify EHS. HF work should always occur in a fume hood, and the fume hood should be labeled "Danger, Hydrofluoric Acid in Use." Also, a special Calgonate first aid kit and Calgonate spill kit should be obtained. Due to the hazard that HF poses, work involving HF should only occur during university working hours and should never occur alone. Furthermore, the following personal protective equipment should be used:

- Laboratory coat
- Acid resistant apron
- Close-toed shoes
- Long pants
- Full-face shield in conjunction with chemical splash goggles
- Gloves
 - For solutions less than or equal to 30% HF, nitrile exam gloves can be utilized. However, it is strongly recommended to double glove.
 - For more concentrated solutions, neoprene rubber gloves should be utilized.

It is also important to remember that HF is reactive with numerous substances, including glass, glazes, enamels, pottery, concrete, rubber, many metals, and many organic compounds. That being said, any excessive use of HF will require a fume hood composed of polyvinyl chloride and polycarbonate.



First Aid

All exposures to HF are considered to be a medical emergency and medical attention should be sought immediately!

- *Skin Exposure:* remove contaminated clothing and wash the area with copious amounts of water for 15 minutes. After washing, apply calcium gluconate first aid gel.
- *Inhalation:* Remove victim to clean air until emergency personnel arrives.
- *Eye Exposure:* Immediately flush eyes for at least 15 minutes with copious amounts of water until emergency personnel arrive.

Storage and Waste

Always store HF in a cool dry place away from incompatible materials, and segregated from other chemicals. HF must be stored in containers composed of polyethylene or fluorocarbon plastic, lead, or platinum. Secondary containment must be used. HF waste should be stored in small containers composed of compatible materials and should be clearly labeled. It is also recommended that security precautions be taken with HF and HF waste to ensure that access is limited to trained personnel.

Spills

Small spills of HF can be neutralized using dry magnesium sulfate, calcium carbonate, calcium hydroxide, or a commercial HF spill kit. Do not use vermiculite to absorb spills as it can result in the generation of hazardous gases.

Any Questions?

Any questions regarding the use, storage, or cleanup of HF spills should be directed to EHS at 405.744.7241.