

Hydrofluoric acid

Process:

Highly toxic etchant for Silicon Oxide and other metal oxides.

Materials:

Hydrofluoric Acid (49%) and water for dilution, sometimes premixed.

Incompatible Materials:

Will dissolve glassware. Be cautious when mixing with acids as toxic HF outgassing will typically occur.

Hazards:

Poor warning properties: harmful exposure and workstation contamination are initially very difficult to detect. A concentrated HF splash the size of three hands can be fatal even when treated. HF numbs the skin, so diluted (<20%) HF burns are not always apparent until up to a day later. Burns from concentrated (49%) HF burns are typically immediately apparent. Fumes are prevalent, highly toxic and detectable (but just barely) at chronically harmful concentrations.

Exposure Actions: Do what's below, and then notify CNM2 staff within a few hours. For advice, call CNM2 staff.

Eyes: Hold eyes open in running eyewash station for 15 minutes and call 911 as soon as possible.

Skin: Remove splashed clothing, wash for 3 minutes, apply Calcium Gluconate gel and call 911.

Personal Protective Equipment:

Goggles, face shield, heavy chemical gloves (blue disposable Nitridex or black Chemtek)¹, and heavy chemical apron. Keep Calcium Gluconate gel handy.

Acceptable Locations For Use:

Wet process stations 3, 13, acid & base fume hood². If heated, only acid & base fume hood. Never open bottles or carry baths away from these ventilated areas because the toxic fumes must not be allowed to circulate through the cleanroom.

Additional Process Notes:

If dilution is needed measure water, add HF, then stir³. Heat only after mixing is complete if greater than ambient temperature is desired⁴.

Disposal:

If heated allow to cool, then decant or aspirate to neutralizer. Heavy metal or organic bearing solutions should instead be disposed of in spent the "Fluorides" bottle⁵.

*Additional SOPs available, see: 1. PPE Choice and Cleaning
5. Haz Waste Management

2. Work Station Cleaning

3. Pouring and Mixing

4. Hotplates