

Safe Working Procedure for Hydrofluoric Acid

Aqueous hydrofluoric acid is sometimes used in organic chemistry for desilylation. It is used in analytical chemistry for sample preparation. It is also used for etching. For organic chemistry uses, all alternatives should be considered before HF is chosen.

A specific risk assessment for this material must be completed.

These guidelines cover only aqueous solutions of the acid, not the pure substance.

Background

Unlike other hydrohalic acids, HF is a weak acid. However, it is much more dangerous because it will readily and rapidly penetrate the skin. Due to the high affinity of fluoride ions for calcium, once absorbed, HF interferes with cell signalling and nerve function and attacks bone structures. It will cause serious burns, but this will not be evident until later (unlike thermal burns). Exposure to HF has caused death.

HF attacks many materials, including glass. aq. HF is usually stored in polyethylene containers.

Precaution

Normal required PPE must be worn: safety glasses, labcoat, long pants, covered shoes. In addition, two pairs of chemically resistant gloves (one over the other) must be worn.

All experiments that involve the handling of HF must be done in pairs, with both people wearing the required PPE. One of the pair will be carrying out the procedure, the other observing, ready to react to any spill or exposure.

HF may only be used in a good fume cupboard. Secondary containment must be available to contain any spills. Material to neutralise spills (e.g. aq. NaOH) must be immediately available. Wastes containing HF should be neutralised, preferably with calcium containing bases (e.g. CaCO_3).

Calcium gluconate gel must be immediately available at the experimental area.

In case of exposure

1. Remove contaminated clothing (if any)
2. Flush with water for ten minutes
3. Apply calcium gluconate gel to the affected area
4. Seek medical attention – symptoms of HF poisoning and burns will **not** be immediately apparent.

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