

Safety Alert – May 2022

Subject: Safety Measures when working with Hydrofluoric acid (HF) and HF-precursors

UNSW Safety are issuing a Safety Alert to remind staff and students that HF is a corrosive and toxic acid that can cause serious burns and even death. The risks of working with HF or HF precursors must be assessed and eliminated or reduced.

Background:

During a laboratory inspection, a 500g bottle of sodium fluoride, an HF precursor, was found stored on a shelf instead of in a toxic storage cabinet. Calcium gluconate, the first aid countermeasure to treat HF exposure and burns, was not available in the first aid kit.

Depending on the concentration of HF, an exposure can result in a serious injury or death. The main cause of death is from the fluoride in HF entering the bloodstream, trapping calcium and magnesium and quickly damaging the heart, muscles and nervous system.

- Skin contact with concentrated solutions of HF can cause severe burns and death. Diluted solutions can also penetrate the skin **without** an immediate burning sensation, reducing workers' awareness of potential exposure. Once HF enters the body, it continues to cause damage even after being washed off.
- Eye contact with HF can quickly cause blindness or permanent eye damage.

Actions taken following the incident:

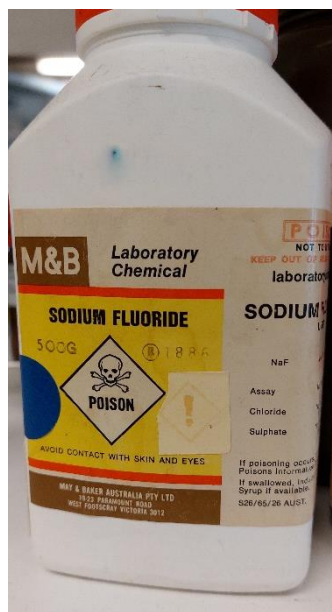
The sodium fluoride container was relocated to a toxic storage cabinet and calcium gluconate was included in the first aid kit. Users have been reminded of the hazards arising from working with HF and HF precursors and risk assessments have been reviewed.

What is recommended going forward:

Steps that can be taken to eliminate or reduce the risk of exposure to HF:

- Wherever possible, replace HF and HF precursors with a less hazardous substance.
- Follow the SDS recommendations for safe storage, handling, first aid, spill management and disposal of the material.
- Assess and document the risks of the proposed work.
- Develop, document, regularly review and train workers in safe work procedures.
- Work with concentrated HF should not be conducted when working alone.

- All workers must be aware of the hazards associated with HF and HF precursors, be fully trained in the safe use of the material and correct use of equipment including personal protective equipment and in emergency and first aid procedures.
- Appropriate Personal protective equipment (PPE) must be available and used: nitrile or natural rubber gloves, PVC apron and shoes, face shield or eye protection.
- First aid and emergency procedures should be relevant for HF work and provide clear instruction on how to deal with HF incidents and potential exposure.
- Calcium gluconate gel (antidote) must be available, stored below 25°C and within the expiry date.
- It is advisable to carry calcium gluconate gel when transporting hydrofluoric acid, in case of an accident or leak occurring during transit.
- In the event of exposure, the full extent of injuries may not be obvious for some hours. Urgent first aid is crucial, even for a minor exposure.



Please contact your Supervisor, Lab Manager or [Safety contact](#) for further guidance on work with HF and HF precursors.

Further Information: safety@unsw.edu.au