

OHS INFORMATION SHEET 24: HYDROFLUORIC ACID

March 2007

This information sheet provides advice for developing, maintaining and implementing local safe work practices for staff, students, contractors and visitors working or studying at the university who handle hydrofluoric acid (HF) or HF containing solutions.

1. WHAT IS HF?

HF is a liquid or gas which is the most corrosive acid known when in concentrated form. Concentrated HF (70%) will fume on contact with air.

2. SYMPTOMS OF HF EXPOSURE

Even small amounts of HF can be fatal. Unlike other acids, dilute HF can react with tissue and bone without significant initial pain. It is imperative that should a person be exposed to HF, first aid be administered **immediately**, and the person transferred to hospital as soon as possible.

Skin: Skin whitening and severe pain occurs with high concentrations of HF. Lower concentrations may severely damage tissue/skin without much pain or visible skin signs.

Eye: Splashes with HF can result in severe pain, spasm of eyelids, red eye and corneal damage.

Ingestion: Mild poisoning causes nausea, vomiting, diarrhoea and abdominal pain. Severe poisoning may rapidly advance to shock, convulsions and death.

Inhalation: Mild exposure can cause coughing, choking; severe exposure may lead to breathing difficulties, muscle spasms, convulsions and death.

3. RISK MANAGEMENT

At a concentration of 0.1% or greater, HF is a hazardous substance under the Occupational Health and Safety (Hazardous Substances) Regulations 1999. HF is also classified as a dangerous good (Class 8, Subsidiary risk 6.1) and a scheduled poison (Schedule 5, 6 or 7, depending on concentration). Each department/school/centre is responsible for completing a risk assessment of any task involving work with solutions containing HF using the [Monash University Risk Control Program](#). Where there is doubt about the potential for exposure, contact OHSE for assistance.

4. SAFE WORK PRACTICES

Anyone using HF must be trained in its use and a second person must be in attendance, aware of the use of HF and be prepared to assist in the event of an emergency. Training in the use of HF is provided by OHSE.

- Tasks involving HF must be undertaken in a fume cupboard.
- Specimen storage areas must be marked as containing HF solutions.
- Solutions containing HF must be stored in polyethylene or Teflon containers. HF reacts with glass and, therefore, solutions containing HF are incompatible with glass storage vessels and equipment.
- Eyewash stations, emergency showers and hand washing facilities must be available in each work area.
- A first aid kit which includes the HF module must be available in each work area.
- Laboratory space and placement of equipment should not create a crowded working environment nor inhibit cleaning.
- All skin and eye contact must be avoided.
- Restriction of laboratory access is important.
- Waste containers for the safe disposal of acids must be provided.
- For information on storage of HF solutions, see the posters [Storing dangerous goods in laboratories, studios and workshops](#), [General chemical storage guidelines for laboratories/studios/workshops](#) and [Purchase and storage of scheduled poisons](#).

5. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Gloves

- Industrial gauntlet PVC outer gloves¹ must be used at all times and discarded at the end of each work session. A surgical glove should be used underneath these to enable ease of removal and avoid hand contamination.
- Replace damaged gloves immediately.
- Remove gloves after task completion to avoid contamination of surfaces (eg before handling telephones, performing office work, leaving the laboratory, etc)

Face, eye, skin and foot protection

- Safety glasses are suitable for low concentration solutions (<1%) of HF being used in small quantities (a few mL) in procedures where splashes are unlikely.
- A face shield and PVC apron must be used for all other applications.
- Closed flat soled shoes must be worn to cover the feet.

Discard gloves at the end of the session and ensure that other PPE is thoroughly cleaned with water after its use and checked for any damage.

Contamination of PPE and clothing

Following any contamination of PPE and/or clothing with HF, remove the garments at once and place them in a large volume of water such as a trough. Preferably, make the water mildly alkaline – for example, add a heaped tablespoonful of sodium bicarbonate. Clothing, heavily contaminated with HF, should be decontaminated (as above) and then be disposed of.

6. WASTE DISPOSAL/NEUTRALISATION

Neutralisation and thorough cleaning after work with HF and HF containing solutions must be conscientiously performed. Where practical, neutralise used HF solutions as soon as possible, putting waste into a correctly labelled, compatible container. Do not recycle solutions.

7. SPILLS

Spills should be neutralised and cleaned up immediately. A solution of calcium carbonate (20% in water) and calcium carbonate chips must be available and used in amounts sufficient to neutralise the acid in the spill area. Alternatively, slow addition of sodium bicarbonate, sodium/calcium hydroxide or sodium/calcium carbonate solid may be used to neutralise spills or unwanted HF solutions to a pH of 7.

8. FIRST AID FOR HF EXPOSURE

Those administering first aid need to be protected from exposure to HF by wearing the appropriate PPE as recommended in the risk assessment. Seek urgent medical assistance and continue first aid measures until medical assistance arrives. In all cases, a copy of the MSDS must accompany the patient to hospital.

1. Call ambulance on 000, then
2. Call security on 333

HF on skin

- Wear suitable gloves and PPE as self protection.
- Remove all contaminated clothing including jewellery/watches/shoes. This is ESSENTIAL. Place all contaminated clothing in a labelled plastic bag until it can be decontaminated.
- Wash skin; keep washing with running COLD water for 15 minutes.
- Apply calcium gluconate gel on and around the affected area.
- Continue to reapply every 15 minutes until medical help arrives.
- The tube of calcium gluconate gel must accompany the patient to hospital and be discarded after use.

HF in the eye

- Remove contact lens if possible.
- Hold eye open and flood eye with gently running water for at least 15 minutes ensuring that the flow of water does not contaminate the unaffected eye.

HF ingestion

- **Never induce vomiting**
- If conscious and cooperative rinse mouth with water. Give further water to drink in order to dilute acid.

HF inhalation

- Remove to fresh air.
- Administer CPR as necessary (Always use a resuscitation mask).

It is essential to continue first aid measures until medical assistance arrives.

General information about first aid, including the HF module, can be found in the [Procedures for first aid](#).

For further information contact your local OHSE Consultant or Occupational Health, Safety & Environment by phone on 990 51016 or by email on ohsehelp@adm.monash.edu.au.

¹ See <http://www.ansell.com.au/specware/> for Glove selection