

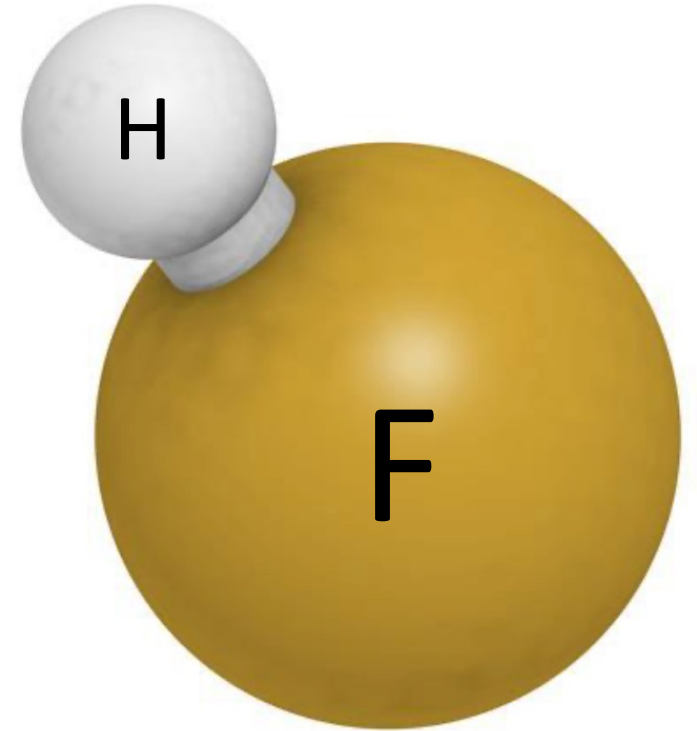
HF Acid Awareness

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HF acid properties

- Chemical formula = HF
- Colorless liquid with a density similar to water
- Will readily dissociate under normal lab environmental conditions to release F gas (toxic) or in the contact with metal to release H gas (explosive)
- Very effective at dissolving silicate bonds, hence its application to geochemistry and the dissolution of silicate minerals in samples
- Used in certain ion exchange chemistries for the separation of certain elements. Very effective at keeping HFSEs in solutions



Dangers of HF acid

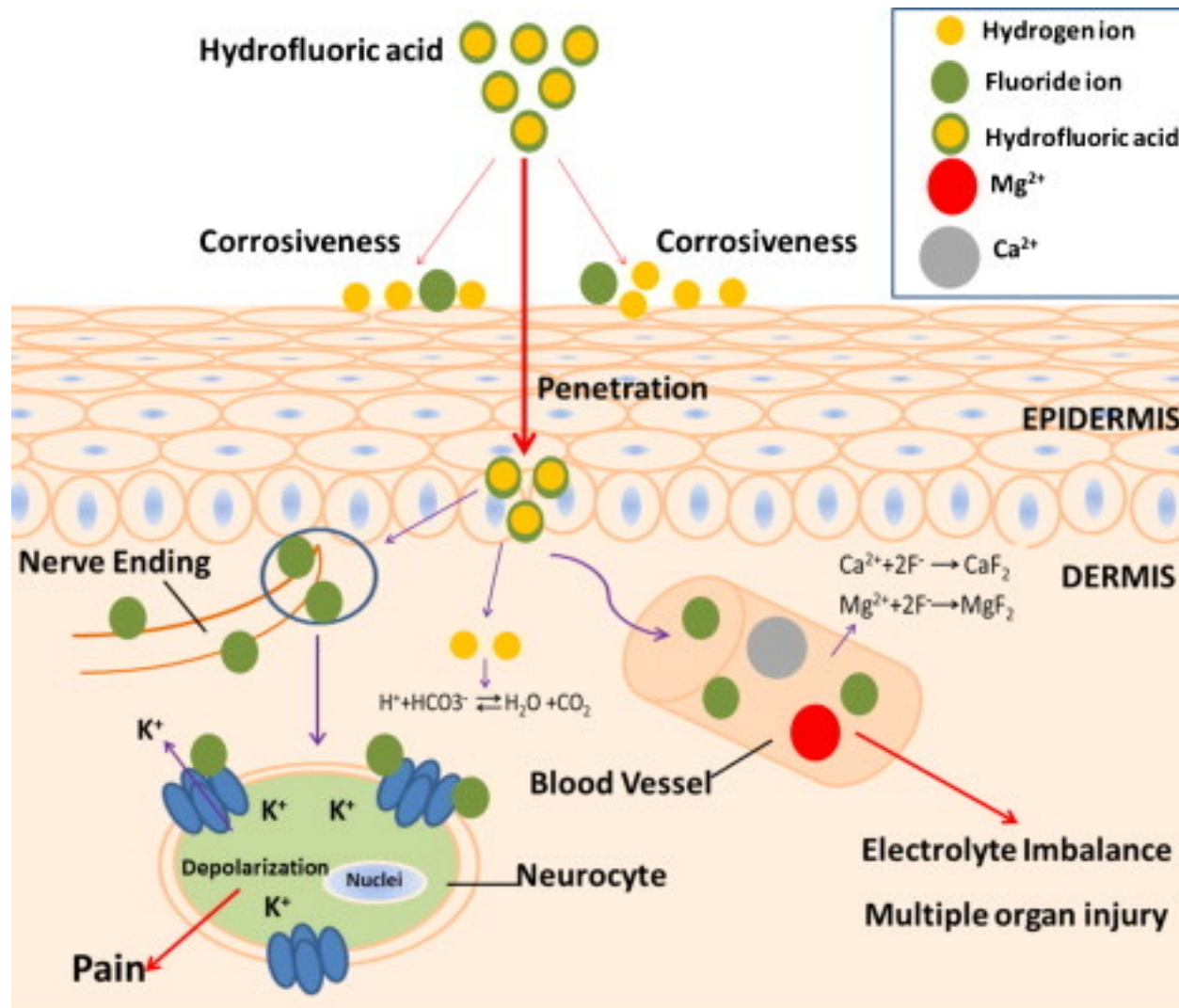
- **HF acid is one of the most dangerous acids known!**
- It must be treated differently to the other acids we use in the lab.
- HF acid does not behave in the same way as other acids we use, such as HCl or HNO₃. Exposure to HF can go unnoticed for long periods of time during which severe damage to tissue and bone can be occurring.
- HF acid has a strong risk of severe injury and death associated with it.



Risk associated with HF acid

- HF acid differs from other acids because it can readily penetrate the skin whereby the F ion can dissociate and cause damage to the deep tissue layer and bone.
- Pain for skin exposure of HF with a concentration 0.7-15M may not be evident for 1-24 hours.
- If the HF is not rapidly neutralised then the F ion will become bound and tissue destruction (necrosis) can prevail. **The loss of limb or life may result.**
- Much like other acids, the extent of the HF burn is a function of concentration, temperature and contact duration.
- Death resulting from HF exposure to as little as 2.5% of the body surface area have been reported.

How does HF acid hurt you?

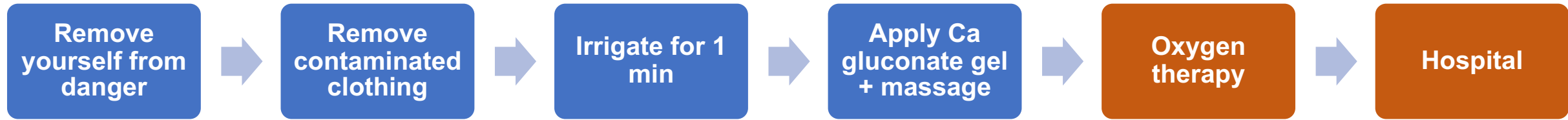


Need for immediate first aid if HF exposure is suspected...



First Aid for HF exposure

- Remove yourself immediately from the room to emergency shower area in case of F gas
- Carefully remove all PPE and clothing. Be alert not to pull contaminated clothing across unaffected parts of the body
- Immediately irrigate affected area under the emergency shower for 1 min. For eye exposure continue irrigation on route to hospital.
- After irrigation immediately apply copious amounts of Ca gluconate gel and begin to massage affected area wearing fresh set of gloves.
- Lab buddy to call school emergency contacts and ambulance (999) stating nature of emergency (chemical) and that HF acid is involved.
- Continue to apply Ca gluconate and massage until first response arrives
- Oxygen therapy will be administered by HF responder
- ***Do not apply Ca gluconate gel or drops to the eyes. Leave contact lenses in place.***
- If in cardiac arrest fetch defib from VJ gallery
- Take hospital pack from lab entry with you!



Lab buddy to call HF responders, 999 and school emergency contacts. Do not put yourself in unnecessary danger!

First responders will manage the incident when they arrive.

Preparing to work with HF

- No lone working with HF. No work outside of normal working hours (08.30-16.30).
- You must use a HF trained buddy in the same room. HF work must be noted on the Teams booking sheet, nominated buddy and HF responder must also be recorded. It is your responsibility to check and notify that there is a HF first responder in the building when doing HF work.
- Ensure eyewash, in date Ca gluconate gel and HF specific spills kit is readily available.
- Ensure that fume hood is clear from clutter and extraction is functioning correctly. Avoid excess sources of heat.
- “Using HF” signage must be clearly displayed on the lab door.
- Visually inspect PPE before use. This should appear pristine before use. Do not blow into gloves!
- Work calmly and slowly
- Carefully remove and inspect PPE after work is completed for spills or damage. This might be the only way to identify a HF spillage!

HF specific PPE

- Lab gown, full length trousers, socks, lab shoes
- Face shield +/- splash goggles
- Two pairs nitrile gloves
- Tyvek sleeves
- Chemical resistant apron

Use of this PPE is mandatory!



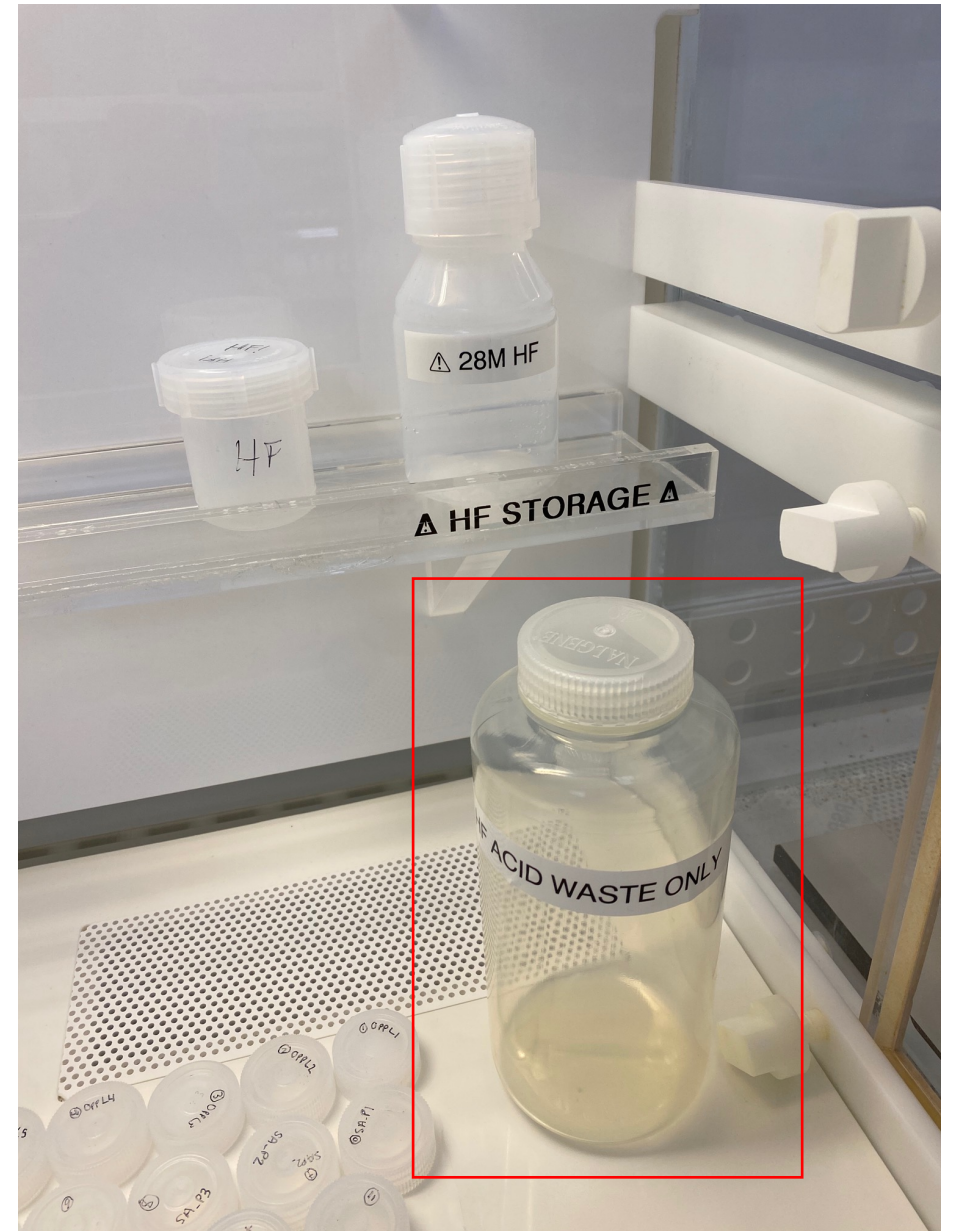
HF storage

- Up to 250 mL of 28M HF stored in a Teflon stock bottle on the back bottom right shelves of each of the laminar flow hoods in -1.39 and -1.42A.
- All pipetting beakers for HF also stored in same area
- Main lab stock of HF is stored under Felcon hood in ultra clean lab. Only EI permitted to access this stock



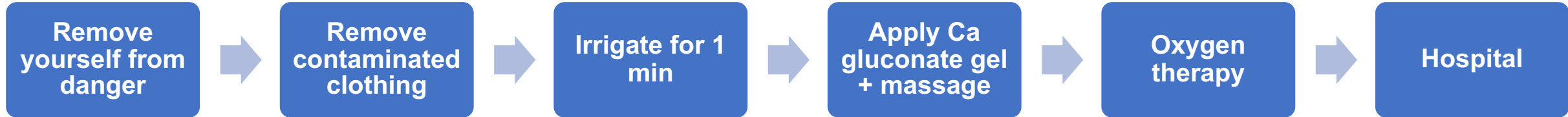
HF disposal

- **All HF waste will be collected in 1000ml acid resistant container stored in hood and transferred to a labelled 2.5L waste bottle stored under Felcom hoods**
- **Disposal down drains is not permitted for any concentration.**
- Pipette tips need to be rinsed with water 3 times prior to disposal.
- Once HF waste storage bottle is 2/3 full notify EI who will arrange transfer and disposal



Summary

- HF acid is a highly dangerous reagent and should be respected.
- Only HF trained users are permitted to work with HF.
- No lone working with HF (buddy system) and must ensure first responder is in the building.
- First aid -



- If you see something wrong or dangerous then report it.