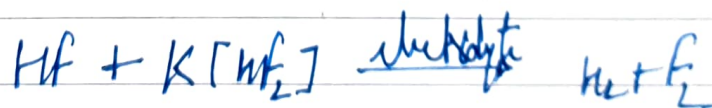
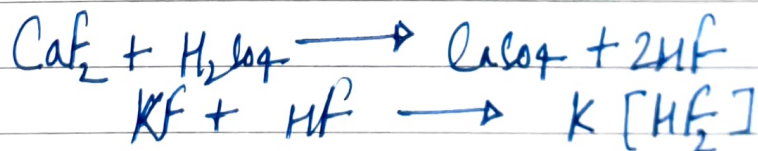


★ Fluorine

Fluorine is extremely reactive, and this causes great difficulties in the preparation and handling of the element. The first preparation of fluorine was by Moissan 1886. He was subsequently awarded the Nobel prize for chemistry in 1906 for this work.

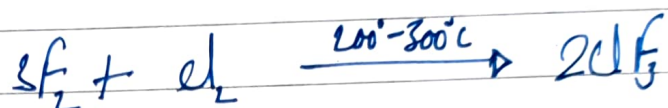
Fluorine is obtained by heating CaF_2 with concentrated H_2SO_4 to give an aqueous mixture of HF . This is distilled yielding anhydrous liquid HF . Then a cooled solution of KHF_2 in anhydrous HF is electrolysed giving F_2 & H_2 .



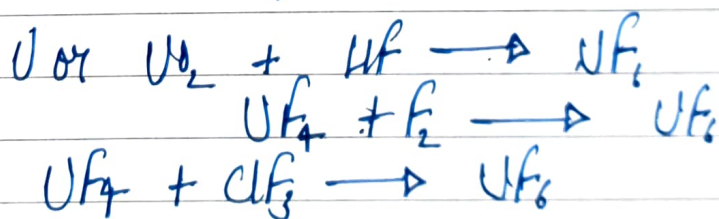
1. HF is corrosive, and itches glass and also cause very painful skin wound. These arise partly by dehydrating the tissue and partly from the acidic nature of HF . The wounds are slow to heal because F^- ions remove Ca^{2+} ion from tissues.

2. Anhydrous HF is only slightly ionized and is therefore a poor conductor of electricity. Thus a mixture of KF in HF with a mole ratio of 1:13. This has the disadvantage that the vapour pressure of HF is high and this gives problem with toxicity and corrosion.
3. Water must be rigorously excluded or the fluorine produced will oxidize it to dioxygen.
4. The hydrogen liberated at the cathode must be separated from the fluorine liberated at the anode by diaphragm otherwise they will react explosively.
5. Fluorine is extremely reactive. It catches fire for example with trace of grease or with crystalline silicon. Glass and most metal are attacked. It is difficult to find suitable material from which to make the iron vessel. Mosaic used & platinum U-tube, since platinum is very un-reactive.

* Cylinders of F_2 are now commercially available. However for many purposes F_2 is converted to ClF_3 (b.p. $12^\circ C$) which though very reactive is less unpleasant and easier to transport.



* Production of fluorine first became important for the manufacture of inorganic fluoride such as AlF_3 and synthetic $Na_2[AlF_6]$. Both are used in the extraction of aluminium. The natural mineral of cryolite is only found in Greenland, and this source is largely exhausted.



* The fluorocarbons are a very interesting and useful group of compounds derived from hydrocarbon by substituting F for H.

Tetrafluoromethane CF_4 is the fluorocarbon by substituting F for H. Corresponding to methane.

