

1) How many electrons does a *fluorine atom* have in total?

Nine

2) How many valence electrons does a *fluorine atom* have?

Seven

3) In general, do *fluorocarbons* compounds occur naturally?

No

4-5) Draw a correct Lewis structure (including lone pairs of electrons) for the following species:

4) Fluoride ion



5) Fluorine gas (F₂)



6) Fluorine is the 13th most abundant element, in what form is it mainly found?

CaF₂, mineral FLUORSPAR

7) What does *perfluorinated* mean?

FULLY FLUORINATED (EVERY C-H IS A C-F)

8) Give one similarity between *hydrogen* and *fluorine*.

BOTH UNIVALENT; SMALL; I = 1/2; form strong bonds to C; ...

9) Give one similarity between *chlorine* and *fluorine*.

7 Valence e⁻; electronegative; leaving group; ...

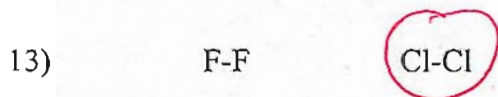
10) How is fluorine produced industrially?

Electrolysis of HF (HF.KF as electrolyte in HF)

11) Fluorine gas is very reactive, and is thus available commercially as a mixture (usually 1-3%) diluted with an inert gas. Name one of those inert gases used.

He or N₂

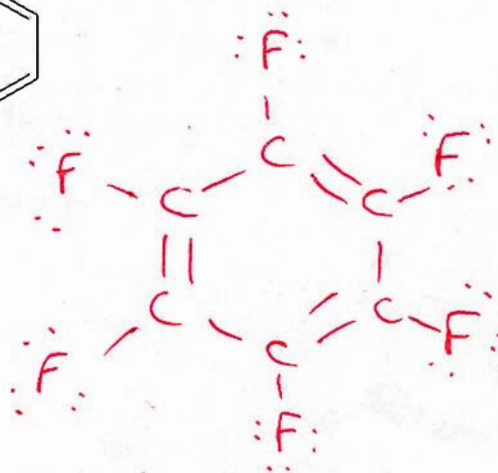
12-14) Circle the molecule with the stronger σ bond:



15) Which chemist first isolated Fluorine?

Henri Moissan

16-17) Draw a correct Lewis structure for:



18-20) What are the three characteristics that make fluorine such a special and unique substituent?

- Next smallest substituent after Hydrogen
- Most electronegative element
- Can form a bond to Carbon that is stronger than a C-H bond.