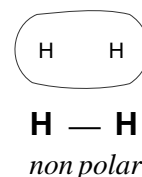


ELECTRONEGATIVITY

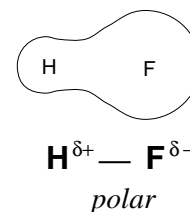
“The ability of an atom to attract the pair of electrons in a covalent bond to itself.”

<i>Bonding types</i>	IONIC Ions are held together because oppositely charged species attract COVALENT Atoms are held together because their nuclei are both pulling on the same shared pair of electrons - a bit like tug-of-war! Nuclear charge, shielding and atomic size affect the pulling power
----------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- Non-polar bond*
- similar atoms have the same electronegativity
 - they will both pull on the electrons to the same extent
 - the electrons will be equally shared
 - the electron density will be symmetrical



- Polar bond*
- different atoms have different electronegativities
 - one will pull the electron pair closer to its end
 - the electron density will be unsymmetrical
 - one end will be slightly more negative than average, δ^-
 - the other will be slightly less negative, or more positive, δ^+
 - a dipole is induced and the bond is said to be polar



- the greater the difference in electronegativity, the greater the polarity of the bond.

The Pauling Scale

- Trends*
- **values increase across periods**
 - nuclear charge is increasing
 - outer electrons are in the same shell
 - no extra shielding**= BIGGER PULLING POWER**
 - **values decrease down groups**
 - increased shielding
 - outer electrons further away**= SMALLER PULLING POWER**

Pauling Electronegativity Values

H						
2.1						
Li	Be	B	C	N	O	F
1.0	1.5	2.0	2.5	3.0	3.5	4.0
Na	Mg	Al	Si	P	S	Cl
0.9	1.2	1.5	1.8	2.1	2.5	3.0
K						Br
0.8						2.8

- Consequences* Bond polarity can influence
- boiling point
 - solubility
 - structure
 - chemical reactivity

Q.

Predict the polarity (if any) of the following bonds

- a) S—Cl b) S—O c) N—O d) C—O e) F—Cl f) C—Cl g) C—C