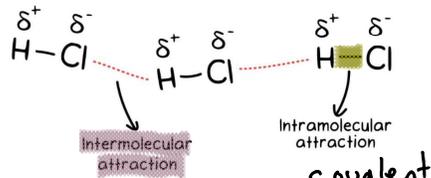
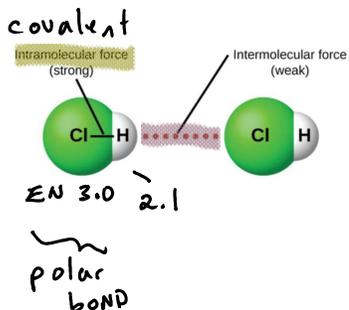


INTERMOLECULAR BONDS

RELATIVE STRENGTH OF BONDS:

IONIC/COVALENT intramolecular ~ 1000 >
 H-BONDS ~ 50 >
 DIPOLE-DIPOLE ~ 10 >
 LONDON DISPERSION FORCES ~ 1

intermolecular



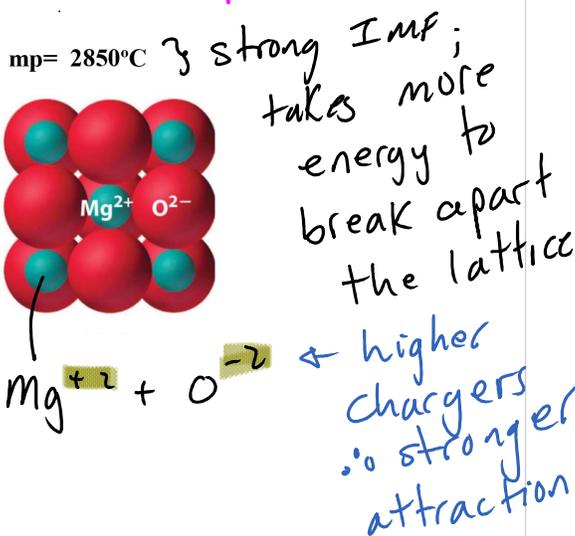
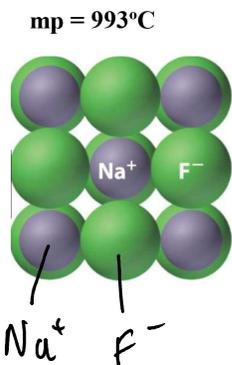
(holds particles together as liquids + solids; causes gas to liquify at low temps)

1. Ionic compounds:

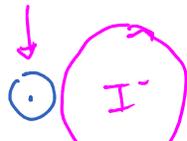
↳ strongest IMF

Melting points:

↳ all solids @ room temp.



NaI
mp 660°C



↑ nucleus is further from Na+ e ∴ weaker attraction.

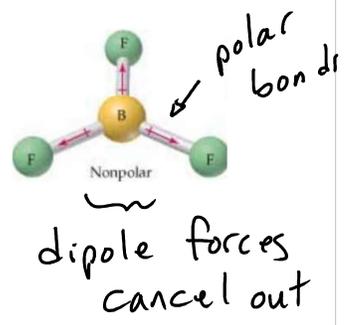
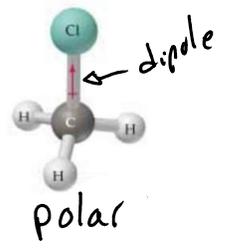
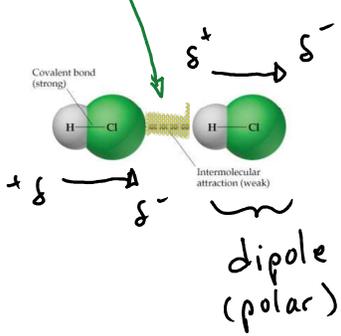
2. Covalent compounds: (dipole/dipole and hydrogen-bonding)

a) Dipole-dipole forces: molecule must have polar bonds and be asymmetric in at least one plane (top-sided).

weak attraction between polar molecules

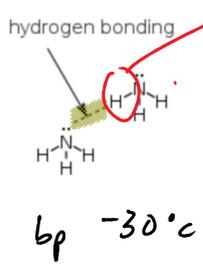
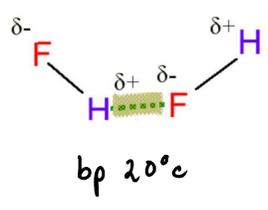
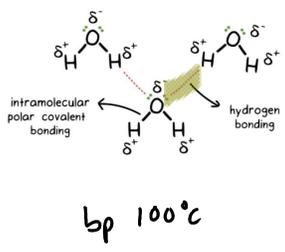


between polar molecules



b) **Hydrogen-bonding** – possible when hydrogen is covalently bonded to **N, O or F**

strongest dipole-dipole force

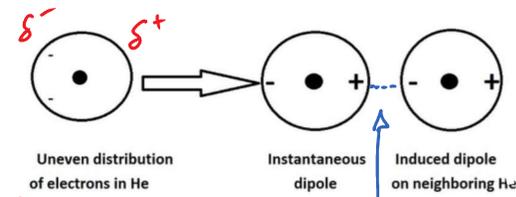


almost a "naked" proton!
very dense positive charge.

LDF

c) London dispersion forces – present between all atoms/ions/molecules

weakest of all IMF



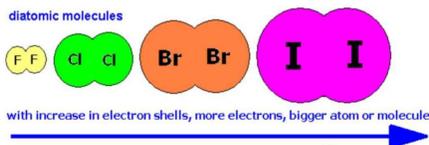
nucleus of one atom attracts e- of another

Effected by:

a) # of electrons:

due to random movement "temporary dipole"

weak attraction



Boiling points: -188 °C -35 °C 59 °C 184 °C

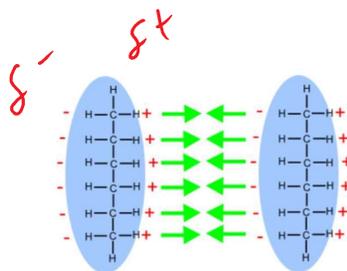
↑ strength of LDF as ↑ # of e-

+ ↑ size of molecules (outer e- further from the nucleus + easier to move.)

b) Size and shape of molecules:



little surface contact



stronger LDF (more surface area contact)