

Ch12

1-14-15

Intermolecular Forces (IMF)

inbetween molecules

vs

Intramolecular forces.

1000x stronger.

inside the molecule  
ex: covalent/ionic bonds.



Intramolecular Forces

Review:

Covalent Bond

- formed from shared pairs e<sup>-</sup>s  
(overlap of pairs of orbitals).



weaker  
+  
longer



stronger  
+  
shorter

Ionic Bonds

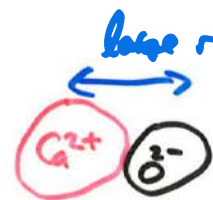
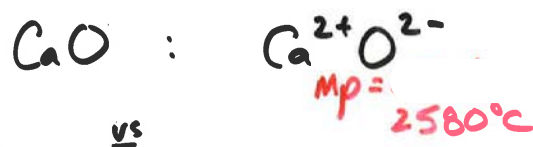


mp = 845°C



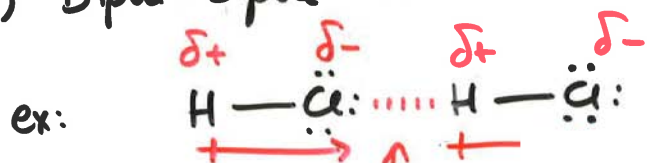
mp = 2800°C

$f \propto \frac{q_1 \times q_2}{r^2}$   
(Coulomb's law)  
charges  
distance.



## Intermolecular forces (IMF)

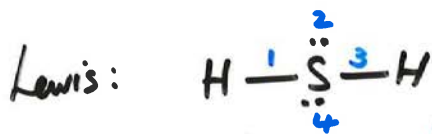
### 1) Dipole-Dipole



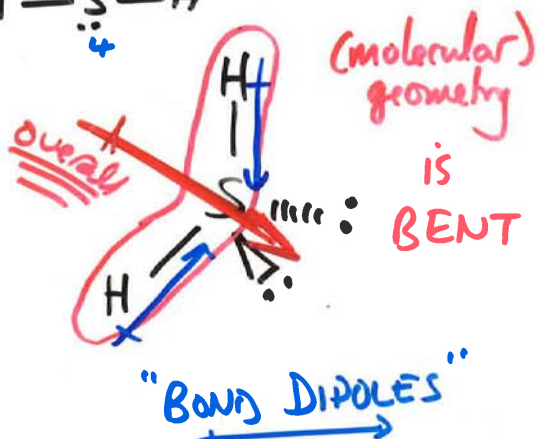
d-d  
IMF

d-d IMF between polar molecules!

ex:  $\text{H}_2\text{S}$

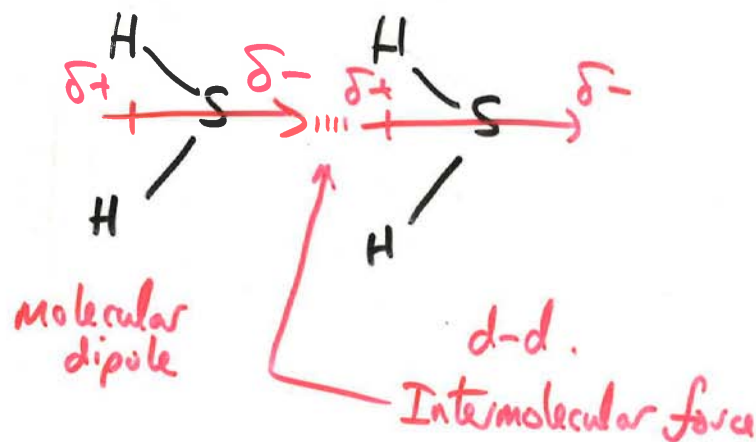


VSEPR:  
4-rp  
⇒ tetrahedral  
(109.5°)



POLAR MOLECULE : non-zero overall dipole

NON-POLAR MOLECULE : zero overall dipole



d-d interactions are VERY WEAK

## 2) ION-DIPOLE

between ion + molecule w/ dipole.

