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Ionic: Transfer of e^-
metal $\xrightarrow{e^-}$ non-metal

Strong
+ to
attraction | $A^+ - B^-$
+ to -

Non-Polar : Equal or nearly equal sharing of e^-
Diatomic ($ED < 0.5$)

$$A \xleftrightarrow[\text{equal}]{e} A \quad A \xleftrightarrow[\text{nearly equal}]{e} B$$

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Ionic Interaction

+ and - Crystal structure

Fe: Ionic
 $A^+ \text{---} B^-$
 (Ionic)

$$\begin{array}{c} \text{VIBRATION} \\ \text{Na}^+ - \text{Cl}^- \cdots \text{Na}^+ - \text{Cl}^- \\ \vdots \quad \vdots \quad \vdots \quad \vdots \\ \text{Cl}^- - \text{Na}^+ \cdots \text{Cl}^- - \text{Na}^+ \end{array}$$

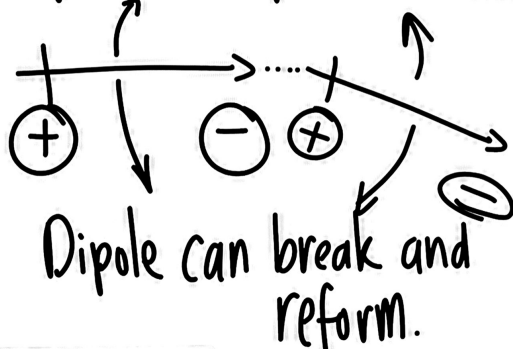
State
Solid

Intermolecular
 Strong

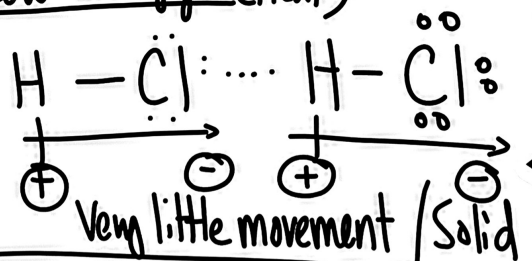
Molecular Interactions

Polar - Polar Bond

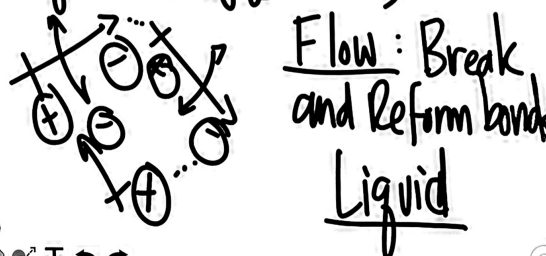
Dipole - Dipole Interaction



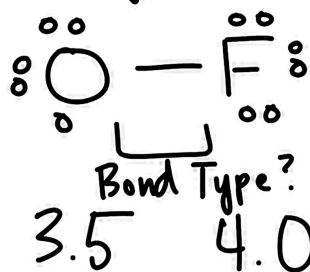
Low Energy (Heat)



Higher Energy (Heat)



Electroneg. and Bond Type (Review) [Intramolecular]



$$\text{EN} \\ 4.0 - 3.5 = 0.5$$

Bond: Polar (slightly)

Ionic: $\text{EN} > 1.9$
Metal = Ionic

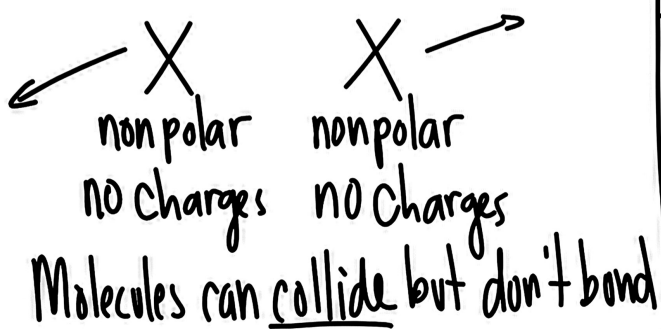
Polar $\text{EN} > 0.4$
No Metals

Non-Polar $\text{EN} < 0.4$
No Metal

Molecular Interactions

Non-Polar - Non-Polar Bond

No Direct Interaction

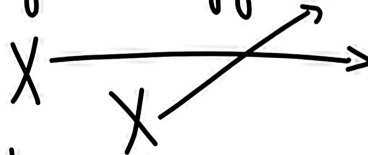


Low Energy (Heat)



Lower speed, gas

Higher Energy (Heat)

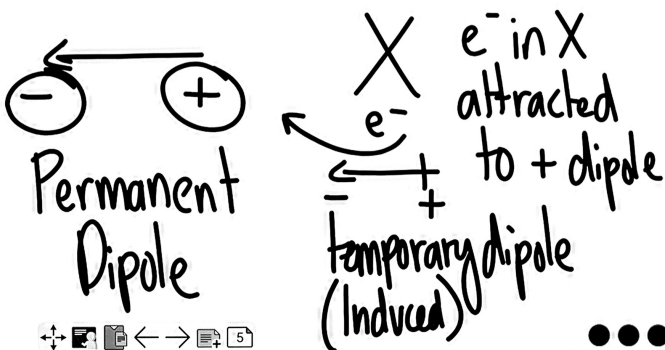


Higher Speed, gas

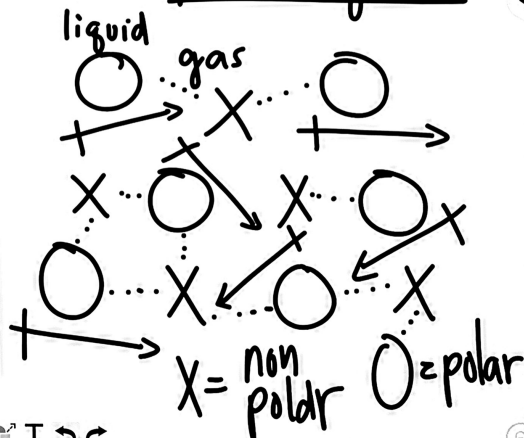
Molecular Interactions

Polar - Non-Polar Bond

Dipole - Induced Dipole



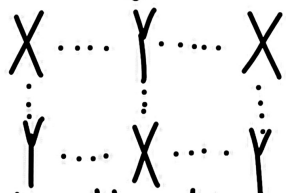
Induced dipoles occur when non-polar gases mix in polar liquids



Bond Strength and States of Matter

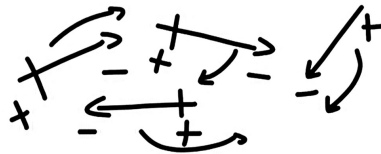
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Solid : Ionic
Strong Inter.



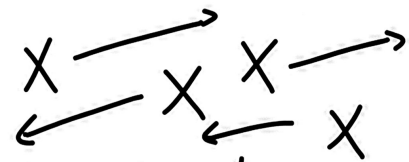
Low Heat/Energy
Vibration Only

Liquid : Polar
Medium Interact.



Medium Heat/Energy
Particles Flow over each
Form/Break Bonds other

Gas : Non-Polar
Weak Interact



High Heat/Energy
Particles Flow / No Bonds