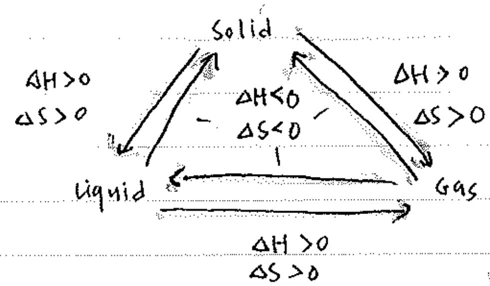
Dai
01/18/2013

The different Phase transitions:



endothermic is positive $\Delta H > 0$, $\Delta S > 0$

exothermic is negative $\Delta H < 0$, $\Delta S < 0$

What if there were no IMFs?

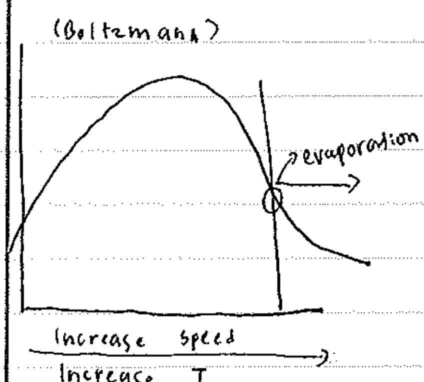
- liquid wouldn't stay is a beaker
- molecules would wander away and spread out all over the universe

Why do we have evaporation?

- Boltzmann distribution explains EVAPORATION!
- when you increase the temperature the kinetic (KE) Energy allows the molecules to break free

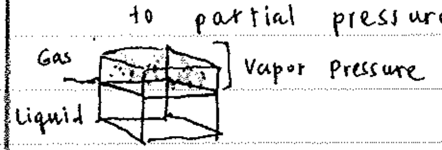
* $KE = \frac{1}{2}mv^2$

(Boltzmann)



* Temperature is (directly) proportional to kinetic energy.

Vapor Pressure - property of liquids, number of molecules directly proportional to partial pressure



- once you achieve vapor pressure, the rate in and out is the same (equilibrium)

↑ volatile liquid = ↑ vapor pressure

The container doesn't affect the vapor pressure (it's a substance property).
At equilibrium they (the same substance) should have the same vapor pressure.

Vapor Pressure - partial pressure of substance regardless of the other gasses

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↑ Vapor Pressure = ↓ ΔH_{vap} (not a linear relationship)
of water it's a exponential relationship

Lower vapor pressure = Stronger IMFs

760 Torr = 1 atm

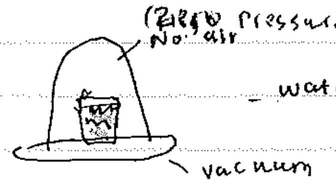
- @ 100°C VP of H_2O = the atmospheric pressure so it boils

- VP = external Pressure, then you have reached the boiling point

- Boiling does not necessarily mean hot, liquid Nitrogen boils @ 77 K

Boiling Temp. → External Pressure

Ex:



water boils @ 25°C

$$\ln\left(\frac{P_2}{P_1}\right) = \Delta H^\circ_{vap}\left[\frac{1}{T_1} - \frac{1}{T_2}\right]$$ Clausius - Clapeyron Equation