TC (September 16, 2008)
Lecture 5 Notes

* ***Ideal Gas Behavior deviation characteristics:***
- A temperature decrease results in more deviation from Ideal Gas Behavior.
- A higher amount of pressure results in more deviation from Ideal Gas Behavior.

*__*IDEAL GAS BEHAVIOR characteristics:*__
- At higher temperatures, there are decreases in the deviation from Ideal Gas Behavior. In other words, gases behave more ideally at higher temperatures.
- At lower pressures, the more "Ideal" the gas behavior is.

*__*Three Phases of Matter:*__

>> ***Gases:***

- Gas particles are in complete chaos as they all have the freedom of motion. In between the particles is empty space.

>> ***Liquids:***

- Liquid particles are close to each other and are in clusters/groups. Like gases, they are also in some disorder but, not like gas particles. If one liquid particle were to move, another one can move in relation to it.

>> ***Solids:***

- Solid particles are neatly combined together to form a pattern that all of the particles abide by. The particles are close-knit and in fixed positions. Motion occurs as vibrations both as the whole solid vibrating together, or as individual particles vibrating in place.

* __***Phase changes:***__
~ __***Kinetic Energy:***__ It is the energy of Motion.
~__***Potential Energy:***__ It is the energy of Separation.
- Melting = Solid to Liquid (energy must be added)
- Fusion/Freezing = Liquid to Solid (when energy is taken away).
- Vaporization/Boiling = Liquid to Gas (energy added, vaporization occurs at the surface of the liquid).
- Condensation = Gas to Liquid (when energy is taken away).
- Sublimation = Solid to Gas (energy added).
- Deposition = Gas to Solid (energy taken away)

*__***Heating Curve:***__
- The relationship between the Temperature and the Heat Added.
- Rising, diagonal lines are the increase in Kinetic Energy.
- Horizontal, straight lines are the Potential Energy Increase.
- The opposite, Cooling Curve, is when the temperature changes when energy is removed.

*__***Phase Diagram:***__

- Shows the relationship between Pressure and Temperature.
- Critical Point:
    > It is the exact pressure and temperature beyond which you can no longer tell the difference between the liquid and gas.
- Liquid, Solid, and Gas are represented with boundaries around them. The boundary lines are the equilibrium lines where both phases are present.

* __***Vapor Pressure:***__

- It is the pressure exerted by the gas particles that boil/evaporate or sublime between the phase changes of a liquid and/or solid.
- When this reaches the pressure of whatever gas is around the substance, the substance is either "boiling" (Liquid to Gas) or "subliming" (Solid to Gas).

- If the pressure around the substance is equal to 760 mmHg = 1 atm, then the temperature where the vapor pressure equals that is called the normal boiling point.
- All liquid and most solids have vapor pressure.
    > At standard pressure, solids will go through a phase change to liquid when the temperature is raised.
    > At standard pressure, some solids will "sublime".
- In a Liquid to Gas phase change, the temperature changes as you add heat to a liquid below its boiling point.
    > When the temperature increases, vapor pressure increases.
    > When the temperature decreases, vapor pressure decreases.