Zoom Meeting 4/3/2020

- Updates:
  - Join Google Classroom: How to will be sent through Remind
  - Chapter 15/ 17 Work is due Tuesday 4/7 through google classroom.

Molarity- a way to measure how concentrated a solution is

M= Moles of solute/ Liters of solution

Moles are a measure of quantity (how many of something there are)

M means molarity which is actually moles per 1 liter

Ex. 0.5 *M* = 0.5 moles/ 1 Liter of solution

Ex. 500mL of a solution with 0.75 *M.* How many moles are in the solution?

500mL → L 500mL x 1 L/ 1000mL = 0.5L

Moles = *M* x Liters of solution

= (0.75 M) (0.5L)

= 0.375 moles

Assignment next week called solution stoichiometry. Using the stoichiometry map with Molarity. There are examples on the the assignment to help you solve the other problems but you should also review the old stoichiometry assignments because there is some old stuff in there too.

Dilution: if you add water to a solution the volume goes up, the concentration goes down but the number of moles of solute stays the same!

moles= Molarity x volume (L)

$Molarity_1 \times Volume_1 = Molarity_2 \times Volume_2$ Dilution equation

Ex. A stock solution of 17.5 M HCl is used to make 500mL of 1.0 M solution. How much of the stock solution is needed? $M_1V_1 = M_2V_2$

17.5M is M_1 because it is bigger (more concentrated). 1.0M is M_2 . Since 500mL is referring to the 1.0M solution, then 500mL must be V_2 500mL = 0.5L

(17.5M) (V_1) = (1.0M) (0.5L) V_1 = (1.0M) (0.5L)/ (17.5M) = 0.029 L = 29mL

Chapter 17

- A reaction will not occur until the reactants collide with enough energy
- More kinetic energy (speed) of the particles means the more frequently they collide which increases the likelihood that the reaction will occur
- Factors that affect the speed of the reaction: temperature (kinetic energy), catalyst (lowers the activation energy), particle size (smaller the particle, more surface is exposed), concentration (increase the amount of reactants= more frequent collisions)

Equilibrium= Balance

- The rate of the forward and reverse reaction are the same so there is no net change in the amount of products and reactants
- Equilibrium expression- gives the ratio of products over reactants
- aA + bB <-->dD + eE (a,b,d,e are coefficients) (ABDE are compounds)

- Product = [D]^d [E]^e
  Reactant [A]^a [B]^b

  Example: H_2 (g) + F_2(g) <--> 2 HF (g)

  $\frac{[HF]^2}{[H_2][F_2]}$

  IF we plug numbers into this equation and solve, it's called the equilibrium constant

Le Chatelier's Principle (Disrupted Equilibrium)

1. Change the temperature- does affect K_{eq} (equilibrium constant)
2. Change the pressure- only affect gases, does not affect K_{eq}
3. Adding or removing product or reactant (changing the concentration of 1 thing)- does not affect K_{eq}

When a disturbance happens on a reaction at equilibrium, the position of equilibrium will shift to reduce the effect of the change

Whatever happens the system responds to do the opposite

a + b <--> d + e + heat (kcal) --- heat is coming out (product) which makes this exothermic

Ex. Increase the temperature- the system will want to decrease the temperature

Shift left

Ex. Increase pressure- favor the side that has less gas particles

a (g) + b (g) <--> d + e (g) + heat (kcal) --- Shift right

Ex. increase [a]-- the system will try to decrease the [a] by using it up

Shift right