Chemistry Chapter 16 (part 1) review- Mukund Murari

Acids and Bases: 16.1-16.4

16.1- Acids and Bases

Arrhenius acids produce hydrogen ions when in an (aq) solution. (H+)
Arrhenius bases produce hydroxide ions when in an (aq) solution. (OH-)

Bronsted- Lowry acids are proton donors.
Bronsted- Lowry bases are proton acceptors.

(The acids are quite similar, but the bases are different as the B-L bases don't need to have an OH group).

An acid is a proton donor, and a base is a proton acceptor
Conjugate acid: The new acid formed when an acid is dissolved in water
Conjugate base: The new base formed in the same situation

A conjugate acid-base pair consists of two substances related to each other by the donating and accepting of a single proton. Two substances related to each other by the donating and
accepting of a single proton

Hydronium ion: The ion formed when H+ ion is transferred from the HCl molecule to the water molecule to form H3O+ (the conjugate acid).

16.2- Acid Strength

Strong acids or bases are completely ionized. A wek acid is one that is ionized only to a slight extent. Strong acids have weak conjugate bases. Weak acids have relatively strong conjugate bases.

Diprotic acid: An acid that can furnish two protons.

Oxyavids: Acids in which the acidic hydrogen is attached to an oxygen atom,

Organic acids: Acids with a carbon-atom backbone

Carboxyl Group: A group containing CO2H, commonly a part of an organic acid

16.3- Water as an Acid and a Base

Amphoteric substance: A substance that can behave as an acid or base. The most common example of this is water.

Ionization of water: A process, which involves the transfer of a proton from one water molecule to another to produce a hydroxide ion and a hydronium ion.

K_w is known as the the **ion-product constant** of water. The units are customarily omitted when the value of the constant is given and used.

Naeutral solution: [H+]=[OH-]
An acidic solution: [H+]>[OH-]
Basic solution: [OH-]>[H+]
In each case, however, Kw= [H+][OH-]= 1.0 X 10^-14

Calculating Ion Concentrations in Water:
1) Kw=[H+][OH-]
2) Substitute in given information
3) Solve algebraically

<u>16.4- The pH Scale</u>

pH is defined as pH=-log[H+]

Steps for calculating pH on a Calculator:
Step 1: Enter the pH
Step 2: Change the sign of the pH using the change-of-sign key
Step 3: Take the inverse log by using the inverse and log keys in that order

pH scale:

7=neutral
over 7 -> 14 = basic
under 7<-0 = acidic