CHEM102

Acids and Bases: Week 1

1. Define Bronsted – Lowry Acids and Bases

- Acid = proton donor, base = proton acceptor.
- Acid + base → salt + water
- A **conjugate acid**, is a base with a hydrogen ion added to it. A **conjugate** base is merely what is left after an **acid** has donated a proton in a chemical reaction.
- Acetate is conjugate base of acetic acid

2. Define and use the pH scale and perform pH calculations for solutions of strong acids and strong bases.

- Strong acid = completely dissociated/reacted. Weak is partially.

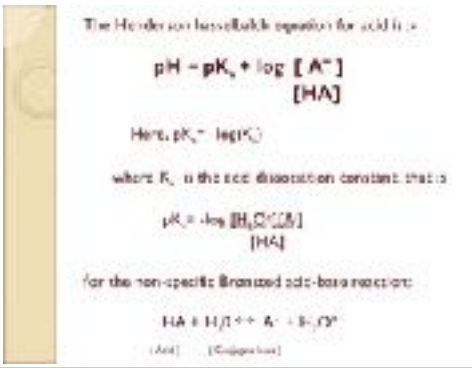
3. Identify weak acids and bases and perform various equilibrium calculations to give e.g. pH of a solution of , e.g., a weak acid, weak base, electrolyte, polyprotic acid.

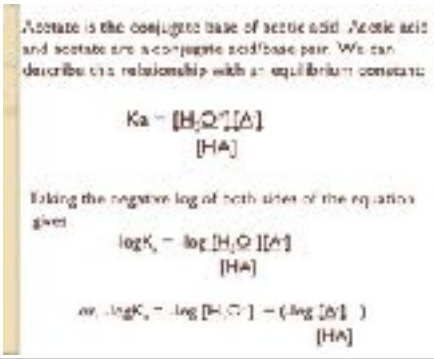
- Pure water has a Kw=10-14 at 25 °C
- pH = -log10 [H+]
- pH can be measured with Membrane Ion Selective Electrode. Selective migration of one ion into / across membrane generates an electric potential proportional to log[H3O]

4. Describe buffer action and capacity and carry out various pH buffer calculations.

- Buffers resist pH change upon the addition of an acidic or basic components. It is able to neutralize small amounts of added acid or base, thus maintaining the pH of the solution relatively stable.
- The Ka 's decrease as hydrogens are removed (become weaker acids)

Week 1 formulae:





$$pK_b = -\log_{10} K_b$$

$$pK_a + pK_b = pK_w$$