UNIT: Acids and Bases

1. Strong electrolytes - conduct electricity, because they ionize in water almost completely. Acids and bases are electrolytes; their strength depends on how well they ionize in water.

Acids: TABLE K

- **Have H+ ions in solution (Arrhenius theory)**
- Proton donor (Bronsted-Lowry theory)
- react with metals to produce hydrogen gas
- turns litmus paper red
- phenolphthalein clear
- taste sour
- pH < 7

Bases: **TABLE L**

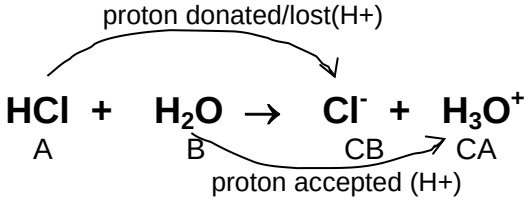
- **Have OH- ions in solution (Arrhenius theory)**
- Proton acceptor (Bronsted-Lowry theory)
- turns litmus paper blue
- phenolphthalein pink
- taste bitter/ feel slippery

2. Amphiprotic or amphoteric substances act as both acids and bases.

3. Bronsted Lowry Theory:

REMEMBER BAAD
Bases Accept and Acids Donate

HCl and Cl- is a conjugate pair
H_2O and H_3O^+ is a conjugate pair



4. Strong conjugate produces a weak conjugate base and visa versa.
Strong conjugate base produces a weak conjugates acid and visa versa.

5. Acids and bases react together :

Acid + Base → Salt + Water

This is called a neutralization reaction. **Every 1 mole of H+ from the acid will neutralize (cancel out) 1 mole of OH- from the base.**

6. Neutralization reactions can be carried out using **titrations**. The **end point** of a titration occurs when neutralization is obtained.

7. At a titration endpoint **moles H+ acid = moles OH- base,** which can be re-written as

$$\mathbf{M_aV_aN_a = M_bV_bN_b}$$ Reference Table T

8. Formulas:
   - pH = Power of H+ ions in solution*** look at the exponent
   - $[H^+] = 10^{-pH}$
   - $[H^+][OH^-] = 1.0 \times 10^{-14}$
   - pH + pOH = 14

$[H^+]$ is called the hydrogen or hydronium ion.
$[OH^-]$ is called the hydroxide ion.

REMEMBER pH = power of the hydronium ion concentration
If H+ = 1.0 x 10^{-4}, the pH of the solution is 4

9. Water is neutral. $[H^+] = [OH^-] = 1.0 \times 10^{-7}$. Has a pH of 7.

10. Indicators can be used to identify pH ranges for unknown chemicals. Know how to determine pH ranges of chemicals using Reference Table M.

11. pH scale is based on powers of 10**… each pH unit is a 10X change**