MIND MAP

Indicator: Substance which shows one characteristic property in one medium and different property in another medium are called indicators.

- **Natural indicator:** Litmus solution, turmeric
- **Synthetic indicator:** Phenolphthalein, methyl orange
- **Olfactory indicator:** Onion, clove oil, vanilla extract.

Base: Substances which give OH^- ion in solution.

- **Strong base:** dissociate completely, e.g. NaOH, KOH.
- **Weak base:** do not dissociate completely, e.g. NH_4OH.
- Base
  - Metal → Salt + $H_2\uparrow$
  - Acid → Salt + H_2O
  - Non-metal oxide → Salt + H_2O
- The properties of a base are due to [OH^-] ion, which it gives in aqueous solution.

Acid: Substances which give H^+ ion in solution.

- **Strong acid:** dissociate completely, e.g. HNO_3, HCl, H_2SO_4.
- **Weak acid:** do not dissociate completely, e.g. CH_3COOH, H_2CO_3.
- **Concentrated acid:** gives more H^+ ion.
- **Dilute acid:** gives less H^+ ion.
- Acid
  - Metal → Salt + $H_2\uparrow$
  - Metal carbonate → Salt + CO_2 + H_2O
  - Base → Salt + H_2O
  - Metal oxide → Salt + H_2O
- The properties of an acid is due to [H^+] ion, which it gives in aqueous solution.

- Strength of an acid or base ∝ Degree of ionization
- Strength of an acid or base $\propto \frac{1}{\text{dilution of an acid or base}}$
- The properties of an acid or base is due to [H^+] ion, [OH^-] ion, respectively which they give in aqueous solution.
- Dilution of an acid or base is an exothermic reaction.

Salt: The ionic compound consisting of two parts, one containing a positive charge (cation) and the other carrying a negative charge (anion)

- Salt of strong acid and strong base: NaCl, KCl
- Salt of strong acid and weak base: NH_4Cl.
- Salt of weak acid and strong base: CH_3COONa.
- Salt of weak acid and weak base: CH_3COONH_4.

pH scale: A scale of numbers from 0 to 14 on which the strength of an acid or base is measured

$pH = -\log[H^+]$ or $pH = -\log[H_3O^+]$

- For a neutral solution
  $[H^+] = [OH^-] = 10^{-7}$ mol/L; pH = 7
- For an acidic solution
  $[H^+] > [OH^-]$; pH < 7
- For a basic solution
  $[H^+] < [OH^-]$; pH > 7

Some chemical compounds

- Sodium hydroxide (NaOH)
- Bleaching powder or Calcium Oxychloride($CaOCl_2$)
- Washing Soda or Sodium Carbonate (Na_2CO_3)
- Baking Soda or Sodium bicarbonate ($NaHCO_3$)
- Plaster of Paris ($CaSO_4 \cdot \frac{1}{2}H_2O$)
- Gypsum ($CaSO_4 \cdot 2H_2O$)