CONCEPT MAP

FORM 4

ACIDS AND BASES

pH value is the measurement of H^+ ions concentration
- pH = –log [H^+], pOH = –log [OH^-]
- Acids: pH < 7, alkalis: pH >7
- pH value depends on the concentration and strength of the acids/bases

Concentration of aqueous solutions in g dm^{-3} or mol dm^3 (molarity)
- Preparation of **standard solutions** from solids or by the dilution method
- Determination of concentrations of acids/ alkalis by **titration**

Acids: chemicals that produce H^+ ions in water.
- Strong acids: Complete ionisation to H^+ ions
- Weak acids: Partial ionisation to H^+ ions
- Basicity: The number of moles of H^+ ions formed from one mole of acid

Properties
- Change the colours of indicators
- React with bases
- React with reactive metals
- React with metal carbonates

Bases: chemicals that react with acids to form salts and water.
- Alkalis: Soluble bases that produce OH^- ions in water
- Strong alkalis: Complete ionisation to OH^- ions
- Weak alkalis: Partial ionisation to OH^- ions

Properties
- Change the colours of indicators
- React with acids
- React with ammonium salts on heating
- React with metal ions

Neutralisation: Reactions between acids and bases that produce **salts** and water

- Preparation of **soluble salts:** Reactions between **acids** with
  - alkalis
  - metal oxides
  - metal carbonates
  - metals
- Preparation of **insoluble salts** by precipitation through the **double decomposition reaction**

Action of heat on salts
- NO_3^- salts produce O_2 or NO_2 and O_2
- CO_3^- salts produce CO_2
- NH_4^+ salts produce NH_3

Qualitative analysis
Identify
- anions by heating, reactions with acids, brown ring test and solutions such as barium chloride and silver nitrate
- cations by reactions with NaOH, NH_3(aq) and specific reagents such as KI and Nessler's reagent