Chapter 2 – Quick Revision Sheet

Acids, Bases and Salts

Acid

Definition:
Acids are substances that produce hydrogen ions (H^+) in aqueous solution.

Reaction:
$HCl \rightarrow H^+ + Cl^-$

Example:
Hydrochloric acid (HCl)

Base

Definition:
Bases are substances that produce hydroxide ions (OH^-) in aqueous solution.

Reaction:
$NaOH \rightarrow Na^+ + OH^-$

Example:
Sodium hydroxide (NaOH)

Chemical Properties of Acids

1. **Reaction with Metals:** React with metals to produce salt and hydrogen gas. { Ex : $Zn + 2HCl \rightarrow ZnCl_2 + H_2$ }
2. **Reaction with Metal Carbonates:** React with metal carbonates to produce salt, H_2O and CO_2. { Ex : $Na_2CO_3 + 2HCl \rightarrow 2NaCl + H_2O + CO_2$}
3. **Reaction with Metal Bicarbonates:** React with metal bicarbonates to produce salt, H_2O and CO_2. { Ex: $NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2$}
4. **Reaction with Metal Oxides:** Acids react with metal oxides to produce salt and water. { Ex: $CuO + 2HCl \rightarrow CuCl_2 + H_2O$}

Chemical Properties of Bases

1. **Reaction with Acids (Neutralization):** Acid reacts with base to form salt and water.
   Example: $HCl + NaOH \rightarrow NaCl + H_2O$
2. **Reaction with Non-metal Oxides:** Bases react with non-metal oxides to form salt and water.
   Example: $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$

Strength of Acids and Bases

Strength of acids and bases depends on the degree of ionization in water.

Strong Acids: HCl, HNO_3, H_2SO_4

Weak Acids: CH_3COOH, H_2CO_3

Strong Bases: NaOH, KOH

Weak Bases: NH_4OH, NH_3, $Al(OH)_3$

Salts

Salts are substances formed by neutralization reaction between an acid and a base. { Example: $HCl + NaOH \rightarrow NaCl + H_2O$ }

Salt	Formula	Reaction	Use
Sodium Hydroxide	$NaOH$	$2NaCl + 2H_2O \rightarrow 2NaOH + H_2 + Cl_2$	Artificial fibres
Bleaching Powder	$CaOCl_2$	$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$	Oxidizing agent
Baking Soda	$NaHCO_3$	$NaCl + NH_3 + H_2O + CO_2 \rightarrow NaHCO_3$	Antacid
Washing Soda	$Na_2CO_3 \cdot 10H_2O$	$2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$	Glass manufacturing