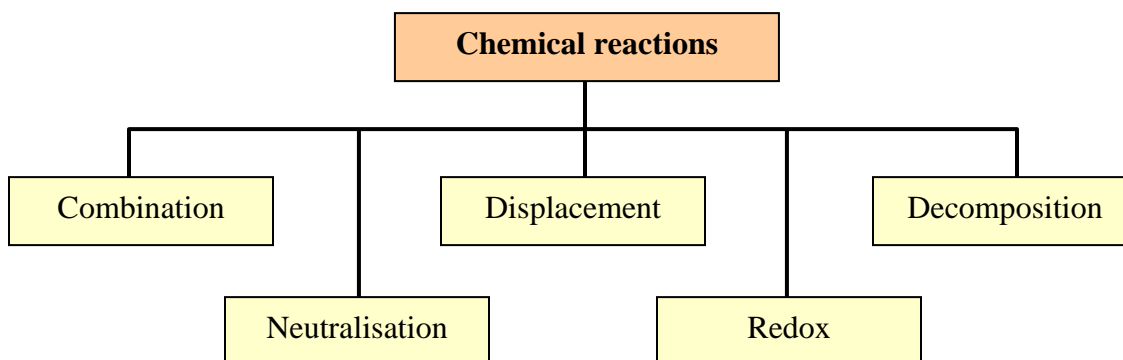


## CHAPTER 5: ENERGY AND CHEMICAL CHANGES

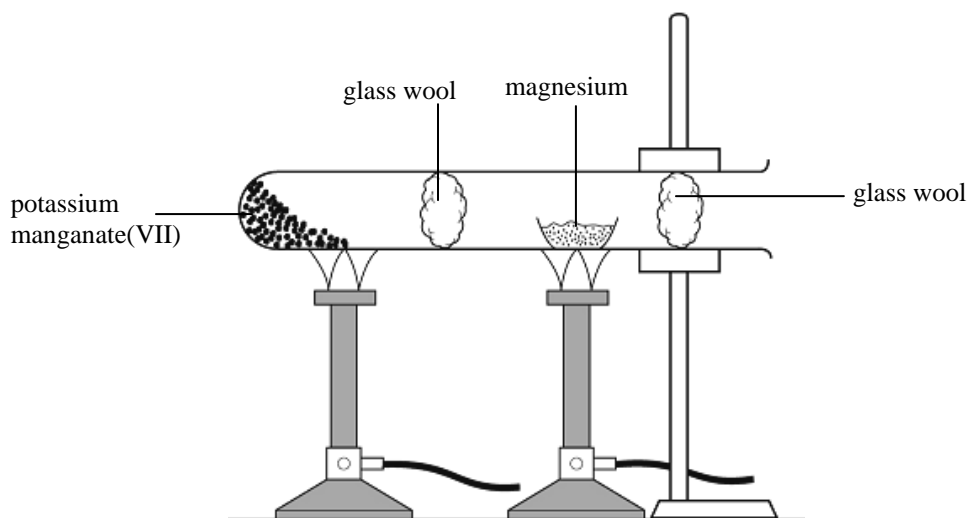
### Types of Chemical Reactions



#### Combination

This is a chemical reaction in which two or more substances combine into one.

- Magnesium + oxygen  $\xrightarrow{\text{heat}}$  magnesium oxide
- Ammonia + hydrogen chloride  $\xrightarrow{\text{heat}}$  ammonium chloride

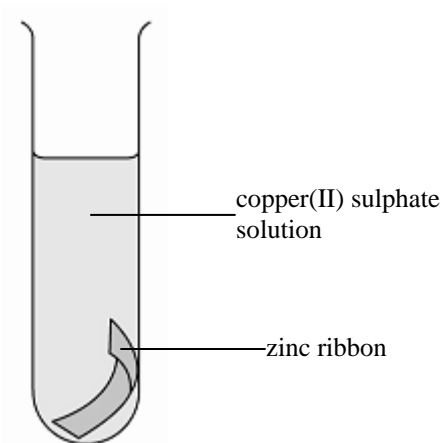


*Reaction between magnesium and oxygen*

## Displacement

This is a chemical reaction in which an active element displaces a weaker element from a compound.

- Zinc + copper sulphate solution  $\rightarrow$  copper + zinc sulphate
- Calcium + hydrogen oxide (water)  $\rightarrow$  hydrogen + calcium hydroxide

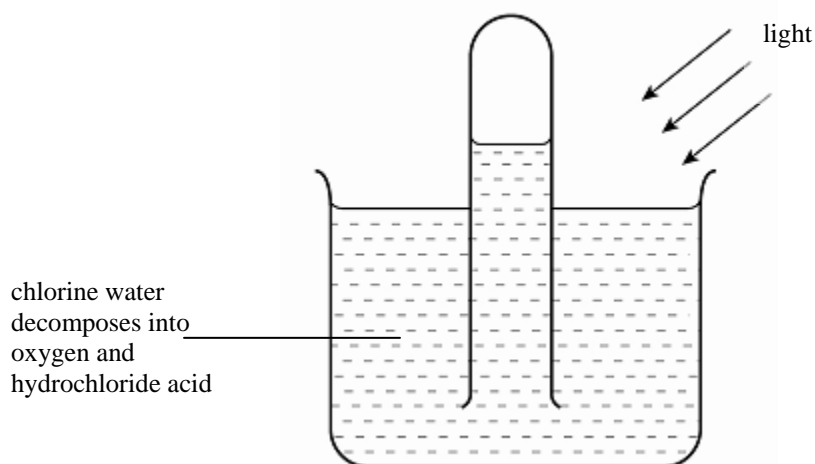


*Displacement reaction of zinc in copper sulphate solution*

## Decomposition

This is a chemical reaction in which a compound breaks down into simpler substances.

- Potassium chlorate  $\xrightarrow{\text{heat}}$  potassium chloride + oxygen
- Silver bromide  $\xrightarrow{\text{light}}$  silver + bromine
- Water  $\xrightarrow{\text{electrical energy}}$  hydrogen + oxygen

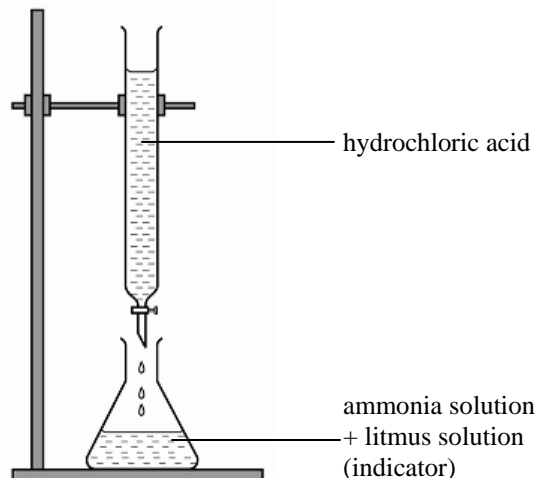


*Effect of light on chlorine water*

### Neutralisation

This is a chemical reaction between an acid and an alkali to form a salt and water only.

- Dilute sulphuric acid + sodium hydroxide  $\rightarrow$  sodium sulphate + water
- Dilute hydrochloric acid + ammonia solution  $\rightarrow$  ammonium chloride + water

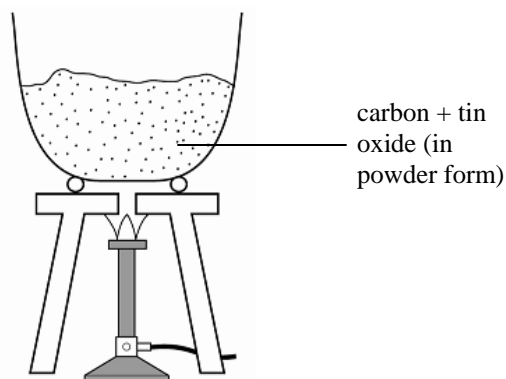


*Neutralising ammonia solution with hydrochloric acid*

### Redox reaction

This is a chemical reaction which involves both oxidation (oxygen is added) and reduction (oxygen is removed).

- $\text{Carbon} + \text{tin oxide} \rightarrow \text{carbon dioxide} + \text{tin}$   
oxidation (Carbon to carbon dioxide)  
reduction (tin oxide to tin)
- $\text{Magnesium} + \text{zinc oxide} \rightarrow \text{magnesium oxide} + \text{zinc}$   
oxidation (Magnesium to magnesium oxide)  
reduction (zinc oxide to zinc)



*A redox reaction*