# CHEMICAL REACTIONS •





### COMBUSTION

**COMBUSTION** or burning is a high temperature exothermic redox chemical reaction between a fuel and an oxidant usually atmospheric oxygen.

 $CH_4 + 2O_2 \rightarrow 2H_2O + CO_2$ 

#### **ADDITION**

ADDITION reaction is a reaction in which one molecule combines which another to form a large molecule with no other product.



 $C_2H_4 + Br_2 \rightarrow C_2H_4Br_2$ 

# **DECOMPOSITION**



DECOMPOSITION reaction involves the breakdown of chemical compound into its elements or simpler compounds. These reactions often involve an energy source such as heat, light, or electricity that breaks apart the bonds of compounds.

2H<sub>2</sub>O<sub>2</sub> Heat > 2H<sub>2</sub>O + O<sub>2</sub>

# PRECIPITATION

PRECIPITATION reaction is the one in which aqueous compounds react to form an insoluble solid, called a precipitate. Whether or not a reaction will form a precipitate is dictated by solubility rules for ionic compounds.



 $2NaOH(aq) + MgCI<sub>2</sub>(aq) \rightarrow 2NaCI(aq) + Mg(OH)<sub>2</sub>(s)$ 

# NEUTRALISATION



**NEUTRALISATION** reaction is the one in which an acid and a base react to form a salt and water. Neutralisation reactions do not necessarily result in a pH of 7, resultant pH is dependent on the strengths of the acid and base.

NaOH + HCI → NaCI + H2O

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### CONDENSATION



CONDENSATION reaction is the one in which two molecules combine to form a larger molecule with a small molecule. The small molecule lost is usually water, but not always. It can be considered to be the opposite of hydrolysis.

CH<sub>3</sub>NH<sub>2</sub> + CH<sub>3</sub>COOH → CH<sub>3</sub>NHCOCH<sub>3</sub> + H<sub>2</sub>O

### **HYDROLYSIS**

HYDROLYSIS reaction involves the breaking of chemical bonds by the addition of water to a substance. In some cases, this addition can cause both the substance and the water molecule to split into two parts.



 $H_2SO_4 + H_2O \rightarrow H_3O^{\dagger} + HSO_4^{-}$ 

# DISPLACEMENT

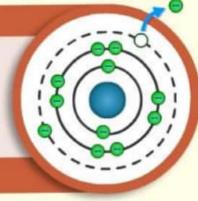


**DISPLACEMENT** reaction is chemical reaction in which a more reactive element displaces a less reactive element from its compound. Both metals and non-metals take part and more reactive displaces the less reactive.

 $Mg + 2H_2O \rightarrow Mg(OH)_2 + H_2$ 

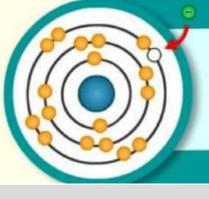
# OXIDATION

OXIDATION reactions are sometimes defined as the reactions in which an element forms bonds with oxygen atoms. Generally, oxidation can be defined as a reaction in which atoms of an element lose electrons.



 $4Fe + 3O_2 + 2H_2O \rightarrow 2Fe_2O_3.H_2O$ 

### REDUCTION



**REDUCTION** reactions are sometimes defined as reactions in which other molecules lose oxygen atoms. Generally, reduction can be defined as a reaction in which atoms of an element gain electrons.

 $Fe_2O_3 +3CO \rightarrow 2Fe + 3CO_2$