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All activities and chemical Reactions

→ Chapter 1 → Chemical Reactions and Equations :-

{Activity 1}:- We took a Magnesium Ribbon which is grey in colour. When we burn it, it burns with a white dazzling flame and converted in white powder. It happens because burning and combustion happens in presence of oxygen. Hence, Magnesium reacts with oxygen and form Magnesium Oxide {White}. We can observe that here Combination Reaction and Oxidation take place.

$$Mg + O_2 \rightarrow MgO$$

{Activity 2}:- We have a solution of lead nitrate and we add a solution of potassium iodide in it. Hence, we can observe a mutual exchange between ions therefore, here a Double displacement takes place. At end we can see that a Precipitate of Yellow colour is formed. Hence we can say it as Precipitation Reaction.

$$\overset{(+)\ (-)}{Pb(NO_3)_2\,(aq)} + \overset{(+)\ (-)}{2KI\,(aq)}$$

$$PbI_2{}^{(s)} + 2KNO_3\,(aq)$$

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{Precipitate} formed of Yellow colour}

{Activity 3}:- We have some zinc granules in a conical flask and add some dilute Sulphuric acid. As we know that zinc is more reactive than Hydrogen therefore it displaces hydrogen, hence we observed that it is a displacement reaction. Also, If we touch the flask we feel hot because during reaction the heat energy has released, therefore it is also an Exothermic reaction.

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$$Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$$

{Activity 4}:- If we took a Beaker and put some water and ~~or~~ small amount of Calcium oxide {Quick lime}. We observed that Calcium oxide reacts with water and form Calcium hydroxide {Slaked lime} and also release some heat energy. Hence, this reaction is combination reaction and exothermic reaction.

$$CaO(s) + H_2O(l) \longrightarrow Ca(OH)_2(aq) + Heat$$

{Activity 5}:- We have crystals of ferrous sulphate which have fixed number of water molecules (water of Crystallisation) and its Colour is Pale Green. If we heat the ferrous sulphate it loses its water molecules and converted into white colour and decomposes into ferric oxide which is Reddish brown in colour and also releases ~~Sulph~~ Sulphur dioxide and Sulphur trioxdie. Hence, it is a decomposition reaction and Endothermic Reaction.

$$2FeSO_4(s) \xrightarrow{\Delta} Fe_2O_3(s) + SO_2(g) + SO_3(g)$$

{Activity 6}:- We have powder of lead nitrate whose colour is white. If we heat it, it decomposes and forms lead oxide of yellow Colour and release Nitrogen dioxide and Oxygen gases. We will observe brown fumes releasing from test tube it is because of Nitrogen dioxide. Hence, it is decomposition and Endothermic reactions.

$$2Pb(NO_3)_2(s) \xrightarrow{\Delta} 2PbO(s) + 4NO_2(g) + O_2(g)$$

{Lead Nitrate} {Leadoxide} {Nitrogen dioxide} {oxygen}

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{Activity 7}:- We have a plastic Mug filled with water we have anode (+) and cathode (-) at the base of the Mug and we also have a 6V battery. Hence, we passes electricity through water therefore it decomposes ~~and~~ into hydrogen and oxygen which are mixed in the ratio of 2:1. We can also add some drops of dilute Sulphuric acid to increase conductivity of electricity. Hence; we observe decomposition and Endothermic Reactions:

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$$2H_2O \xrightarrow{\text{Electricity}} 2H_2 + O_2$$

{Hydrogen — Cathode} → 2 Hydrogen
{Oxygen — Anode} → 1 oxygen

{Activity 8}:- We have a blue solution of Copper ~~Sulph~~ Sulphate and if we dip an iron nail inside it we will observe after sometime that the blue solution becomes pale green and fade and a brown Coating on Iron Nail. It happens ~~due~~ because Iron is more reactive than Copper. Hence, it is a displacement Reaction.

$$Fe(s) + CuSO_4(aq) \longrightarrow FeSO_4(aq) + Cu(s)$$

{Copper Sulphate} {Iron Sulphate}

{Activity 9}:- We have 2g of Silver chloride in a China dish and put it into Sunlight. The Colour of Silver chloride is white but now it turns into grey because in the presence of Sunlight Silver Chloride decomposes into Silver and Chloride. Hence, it is a decomposition reaction and Endothermic reaction. It is used for black and white photography.

$$2AgCl(s) \xrightarrow{\text{Sunlight}} 2Ag(s) + Cl_2(g)$$

Note:- Silver bromide also behaves in the same way.

$$2AgBr(s) \xrightarrow{\text{Sunlight}} 2Ag(s) + Br_2(g)$$

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{Activity 10}:- If we take about 3 ml of sodium sulphate solution and add barium chloride solution into it we can see a precipitate of white colour is formed. It happens due to the mutual exchage of ions therefore it is a double displacement reaction or Precipitation Reaction.

(+) (-) (+) (-)

$Na_2SO_4(aq) + BaCl_2(aq) \longrightarrow BaSO_4(aq\downarrow) + 2NaCl(aq)$

{Sodium sulphate} {Barium chloride} {Barium Sulphate} {Sodium chloride}

$Na_2SO_4(aq) + BaCl_2(aq) \rightarrow BaSO_4(s) + 2NaCl(aq)$

{Activity 11}:- Take about 1g of Copper powder in a China Dish and heat it Bumer. After some time you will observe that the Brown Copper Powder converts into Black because the burning happens in the presence of oxygen. Therefore, here oxidation is happening also Combination and Endothermic reaction is happening.

$$2Cu + O_2 \xrightarrow{heat} 2CuO$$

Note:- If we pass hydrogen gas from Copper oxide the reduction happens and the colour of black Copper oxide ~~again~~ converts into Brown Colour.

oxidation

$$CuO + H_2 \xrightarrow{\Delta} Cu + H_2O$$

Reduction

oxidizing agent :- Cu } Important
Reducing Agent :- H_2

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Lists of Chemical Reactions — Ch-1

i) $Mg + O_2 \longrightarrow MgO$

ii) $Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$

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iii) $CO(g) + 2H_2(g) \xrightarrow{\text{Heating}} CH_3OH$

iv) $6CO_2(aq) + 12H_2O(l) \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6(aq) + 6O_2(aq) + 6H_2O(l)$
{glucose}

v) $CaO(s) + H_2O(l) \longrightarrow Ca(OH)_2(aq) + \text{Heat}$
{Quicklime} {Slaked lime}

vi) $C(s) + O_2(g) \longrightarrow CO_2(g)$

vii) $2H_2(g) + O_2(g) \longrightarrow 2H_2O(l)$

viii) $CH_4(g) + 2O_2(g) \longrightarrow CO_2(g) + 2H_2O(g)$
(methane)

ix) $C_6H_{12}O_6(aq) + 6O_2(aq) \longrightarrow 6CO_2(aq) + 6H_2O(l) + \text{energy}$

x) $2FeSO_4(s) \xrightarrow{\Delta} Fe_2O_3(s) + SO_2(g) + SO_3(g)$
{Ferrous Sulphate} {Ferrous oxide}

xi) $CaCO_3(s) \xrightarrow{\Delta} CaO(s) + CO_2(g)$
{Limestone} {Quick Lime}

xii) $2Pb(NO_3)_2(s) \xrightarrow{\Delta} 2PbO(s) + 4NO_2(g) + O_2(g)$
{Lead Nitrate} {Lead oxide} {Nitrogen dioxide} {oxygen}

xiii) $2AgCl(s) \xrightarrow{\text{Sunlight}} 2Ag(s) + Cl_2(g)$

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xiv) $2AgBr(s) \xrightarrow{\text{Sunlight}} 2Ag(s) + Br_2(g)$

xv) $Fe(s) + CuSO_4(aq) \longrightarrow FeSO_4(aq) + Cu(s)$
{Copper Sulphate} {Iron Sulphate}

xvi) $Zn(s) + CuSO_4(aq) \longrightarrow ZnSO_4(aq) + Cu(s)$
{Copper sulphate} {Zinc Sulphate}

xvii) $Pb(s) + CuCl_2(aq) \longrightarrow PbCl_2(aq) + Cu(s)$
{Copper Chloride} {Lead Chloride}

xviii) $Na_2SO_4(aq) + BaCl_2(aq) \rightleftharpoons BaSO_4(s) + 2NaCl(aq)$
{Sodium Sulphate} {Barium Chloride} {Barium Sulphate} {Sodium Chloride}
↓ Precipitate

xix) $2Cu + O_2 \xrightarrow{\Delta} 2CuO$

xx) $CuO + H_2 \xrightarrow{\Delta} Cu + H_2O$

xxi) $ZnO + C \longrightarrow Zn + CO$
(C: oxidised; ZnO: reduced)

xxii) $MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_2O + Cl_2$