Chp. 1 Chemical Reactions & Equations

Answer the following.

Q1. Why should a magnesium ribbon be cleaned before burning in air?

⇒ When magnesium ribbon is burned exposed to air, a layer of MgO is formed on its surface preventing it from burning. Hence, it should be cleaned using a piece of sand paper.

Q2. Write the balanced equation for the following chemical reactions.

(i) Hydrogen + Chlorine → Hydrogen Chloride

⇒ $H_2 + Cl_2 \rightarrow 2HCl$

(ii) Barium Chloride + Aluminium sulphate → Barium sulphate + Aluminium Chloride

⇒ $3BaCl_2 + Al_2(SO_4)_3 \rightarrow 3BaSO_4 + 2AlCl_3$

(iii) Sodium + Water → Sodium Hydroxide + Hydrogen

⇒ $2Na + 2H_2O \longrightarrow 2NaOH + H_2$

Q3. Write a balanced chemical with state symbol for the following reactions.

⇒ (i) Solutions of Barium ~~Chloride~~ Chloride and Sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.

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

(ii) Sodium Hydroxide solution reacts with hydrochloric ~~and~~ acid to produce some sodium chloride solution and water.

⇒ $NaOH + HCl \longrightarrow NaCl + H_2O$

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Q1. A solution of a substance 'x' is used for white washing.

(i) Name the substance 'x'.

⇒ CaO — Calcium Oxide

(ii) Write the reaction of 'x' with water.

⇒ $CaO + H_2O \rightarrow Ca(OH)_2 + Heat$

Q2. Why is the amount of gas collected in one of the test tubes in Activity 1.7 double of the amount collected in the order? Name this gas.

⇒ Water molecule contain two atoms of Hydrogen and one part of oxygen therefore during electrolysis of water the amount of Hydrogen gas collected in one test tube is double that of oxygen which is collected in the other test tube.

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Q3.

Q1. Why does the colour of $CuSO_4$ change when an iron nail is dipped in it?

⇒ • Iron is more reactive than copper so when an iron nail is dipped in $CuSO_4$ solution, iron displaces copper from its solution.

• We can see two observations:

1. Blue colour of $CuSO_4$ changes to a green coloured $FeSO_4$.
2. Iron nail gets coated by copper and looks brown in colour.

$$Fe_{(s)} + CuSO_4 \longrightarrow FeSO_4 + Cu$$

(iron) + (copper sulphate) ⟶ (iron sulphate) + (copper.)

Q2. Give an example of double displacement reaction other than the one given in Activity 1.10.

$$Pb(NO_3)_2 + 2KI \longrightarrow PbI_2 + 2KNO_3$$

(lead nitrate) + (Potassium iodide) ⟶ (lead iodide) + (Potassium nitrate)

Q3. I- dentify the substances that are oxidised and substances that are reduced in the following:

(i) $4Na(s) + O_2(g) \rightarrow 2Na_2O(s)$

⇒ Sodium is oxidised to sodium oxide.

(ii) $Cu_2O(s) + H_2(g) \rightarrow Cu + H_2O$

⇒ Cu_2O (copper oxide) is reduced to copper.

⇒ H_2 (hydrogen) is oxidised to give H_2O (water)

* Exercises

Q4. What is a balanced chemical equation? Why should it be balanced?

⇒ • When the mass of the reactants is equal to the mass of the products it is called a balanced chemical equation.

• Chemical equations should be balanced because mass can neither be created nor be destroyed. In a chemical reaction. It is the law of

conservation of mass.

Q9. What does one mean by exothermic and endothermic reactions? Give examples.

⇒ • Exothermic reactions are the reactions in which heat is released along with the products.

e.g. $C + O_2 \longrightarrow CO_2 + \Delta$

• Endothermic reactions are the reactions in which heat is absorbed.

$CaCO_3 \xrightarrow{\text{heat}} CaO + CO_2$

Q10. Why is respiration considered as an exothermic reaction? Explain.

⇒ During respiration glucose combines with oxygen in the cells of our body & provides energy.

As energy is released during respiration it is called exothermic reaction.

$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O$ + energy

Q11: Why are decomposition reactions called the opposite of combination reactions? Write equations for these reactions.

⇒ • In this reaction a single compound is broken down to give two or more products. Mostly, all the decomposition reactions are endothermic.

e.g. $CaCO_3 \xrightarrow{\text{heat}} CaO + CO_2$

• In this reaction, two or more elements (reactants) combine together to give new compount (product) (single). Mostly, all the combination reactions are Exothermic.

e.g. $CaO + H_2O \longrightarrow Ca(OH) + \Delta$

Q12. Write one equation each for decomposition reaction where.

⇒ (a) $CaCO_3 \xrightarrow{\Delta} CaO + H_2$

(b) $2AgCl \xrightarrow{\text{sunlight}} 2Ag + Cl_2$

(c) $2H_2O \xrightarrow{\text{electricity}} 2H_2 + O_2$

Q13. What is the difference between displacement & double displacement reaction? Write equations for these reactions.

⇒ • Those reactions in which more reactive displaces less reactive element from its compound (salt solution) are called displacement reactions.

e.g. $Fe + CuSO_4 \longrightarrow FeSO_4 + Cu$.

• Those reactions in which two compound exchange their ions to form new compounds are called double displacement reactions.

e.g. $Na_2SO_4 + BaCl_2 \longrightarrow NaCl + BaSO_4$

Q14. In the refining of silver, the recovery of silver from silver nitrate solution involved displacement by copper metal. Write down the reaction involved.

⇒ $2AgNO_3 + Cu \longrightarrow Cu(NO_3)_2 + 2Ag$

Q15 What do you mean by a precipitation reaction?

⇒ Those reactions when two compounds react to form insoluble compound which is called precipitate s are called precipitation reaction.

e.g. $Na_2SO_4 + BaCl_2 \longrightarrow 2NaCl + BaSO_4$

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SORRY FOR THE HANDWRITING AND SPELL ERRORS :)