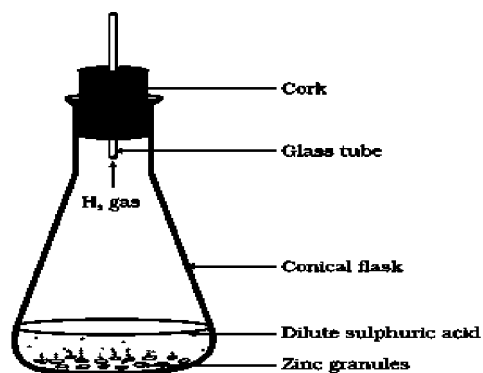


CHAPTER No. 1

CHEMICAL REACTIONS AND EQUATIONS

HOTS: (High Order Thinking Skill) Questions with Answers:

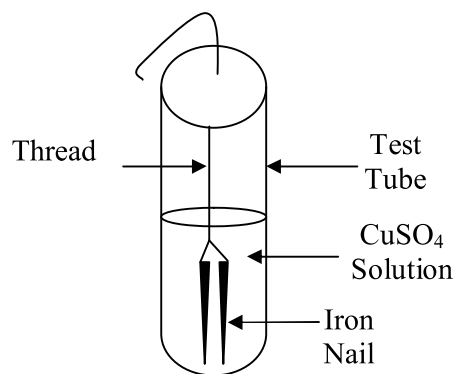
- 1 A compound 'X' is used for drinking, has $\text{pH} = 7$. Its acidified solution undergoes decomposition in presence of electricity to produce gases 'Y' and 'Z'. The volume of Y is double than Z. Y is highly combustible whereas Z is supporter of combustion. Identify X, Y & Z and write the chemical reactions involved.
- 2 An aqueous solution of metal nitrate P reacts with sodium bromide solution to form yellow ppt of compound Q which is used in photography. Q on exposure to sunlight undergoes decomposition reaction to form metal present in P along with reddish brown gas. Identify P & Q. Write the chemical reaction & type of chemical reaction.
- 3 Bhawana took a pale green substance A in a test tube, and heated it over the flame of a burner. A brown colored residue B was formed along with evolution of two gases with burning smell of sulphur. Identify A & B. Write the chemical reaction involved.
- 4 A student took 2-3 g of a substance X in a glass beaker & poured water over it slowly. He observed bubbles along with hissing noise. The beaker becomes quite hot. Identify X. What type of reaction is it?
- 5 A reddish brown vessel developed a green colored solid X when left open in air for a long time. When reacted with dil H_2SO_4 , it forms a blue colored solution along with brisk effervescence due to colourless & odourless gas Z. X decomposes to form black colored oxide Y of a reddish brown metal along with gas Z, Identify X, Y, & Z.
- 6 A substance X used for coating iron articles is added to a blue solution of a reddish brown metal Y, the color of the solution gets discharged. Identify X and Y & also the type of reaction.
7. A student has mixed the solutions of lead (II) nitrate and potassium iodide.
 - (i) What was the colour of the precipitate formed? Can you name the compound precipitated?
 - (ii) Write the balanced chemical equation for this reaction.
 - (iii) What type of reaction is it?
8. Observe the following activity & answer the questions



- Do you observe anything happening around the zinc granules?
- Is there any change in its temperature?
- Why is glass tube not dipped in dil H_2SO_4 ?
- How is H_2 gas collected by downward displacement or upward displacement of water?
- Is H_2 gas soluble or insoluble in water?
- Is H_2 gas heavier or lighter than air?

9. A reddish brown metal X when heated in presence of oxygen forms a black compound Y which is basic in nature when heated with hydrogen gas gives back X. Identify X & Y. Write the chemical reaction between Y & H_2 . Identify the substance being oxidized & reduced.

10 Name the type of reaction seen in the diagram below. Write the reaction for the same.

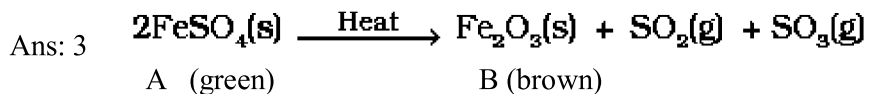
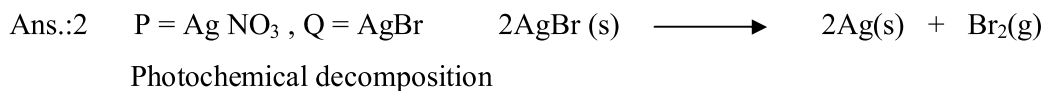
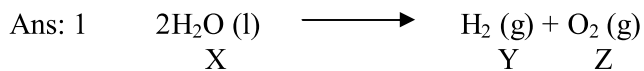


11. A student burnt a metal A found in the form of ribbon. The ribbon burnt with a dazzling flame & a white powder B is formed which is basic in nature. Identify A & B. Write the balanced chemical equation.

12. A student dropped few pieces of marble in dilute HCl contained in a test tube. The gas evolved was passed through lime water. What change would be observed in lime water? Write chemical reactions for both the changes observed.

13. Astha has been collecting silver coins and copper coins. One day she observed a black coating on silver coins and a green coating on copper coins. Which chemical phenomenon is responsible for these coatings? Write the chemical name of black and green coatings

Answers



Ans: 4 a) X = Calcium oxide (Quick lime), Combination reaction.

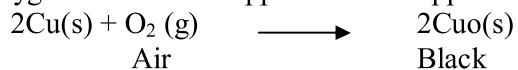
Ans. 5 X = CuCO_3 , $\text{Cu}(\text{OH})_2$, Y = CuO , Z = CO_2

Ans. 6 X = Fe , Y = Cu , Displacement reaction.

Ans. 7 (i). Yellow, Lead iodide
(ii) $\text{Pb}(\text{NO}_3)_2 + \text{KI} \xrightarrow{\quad\quad\quad} \text{PbI}_2 + 2\text{KNO}_3$
(iii) Double displacement reaction

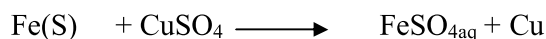
Ans.8 a. Bubbles of hydrogen gas.
b. Yes temperature will increase.
c. H_2SO_4 will rise in glass tube, preventing H_2 to evolve
d. downward displacement
e. Insoluble
f. lighter than air

Ans. 9 Oxygen reacts with copper to form copper oxides which has black colour



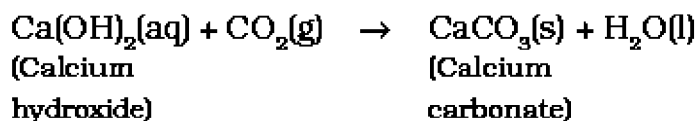
The copper (II) oxide is losing oxygen and is being reduced. The hydrogen is gaining oxygen and is being oxidized.

Ans.10 Displacement Reaction



Ans.11 X = Mg , Y = MgO , $\text{Mg} + \text{O}_2 \xrightarrow{\quad\quad\quad} 2\text{MgO}$

Ans.12 $\text{Ca}(\text{OH})_2(\text{aq}) + \text{CO}_2(\text{g}) \xrightarrow{\quad\quad\quad} \text{CaCO}_3(\text{s}) + \text{H}_2\text{O}(\text{l})$



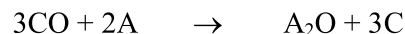
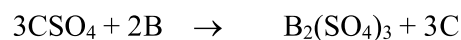
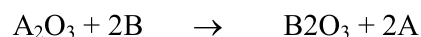
Ans.13 Corrosion is responsible for this coating. Black coating is due to formation of Ag_2S and green coating is due to formation of $\text{CuCO}_3 \cdot \text{Cu(OH)}_2$

PRACTICE QUESTIONS

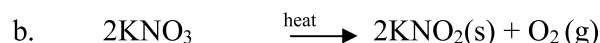
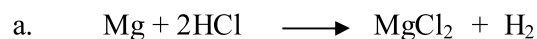


Identify the type of reaction.

2. What does the symbol (g) used with water indicate?
3. How can we prevent fried food from turning 'Rancid'?
4. Why does lime water turn milky when CO_2 is passed into it?
5. Which gas is evolved when lead nitrate is heated?
6. During electrolysis of water, how can we identify the gas present in each test tube?
7. Give an example of a photolytic reaction which is not a decomposition reaction?
8. $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$
In above reaction iron nail becomes brownish in colour and the blue colour of copper sulphate solution fades. Why?
9. Identify the element which is most reactive and the element which is least reactive?



10. Write a chemical equation of a reaction in which a precipitate is formed.
11. Write your observation when Magnesium ribbon is burned in air? Name the powder formed.
12. Which characteristics of a chemical change do you observe when dilute sulphuric acid is added to zinc granules in a conical flask ?
13. Write word equation for the following chemical equation :



14. What happens when CO_2 (g) is bubbled through lime water. Write the chemical equation.
15. What happens when a silver spoon is kept immersed in aqueous copper sulphate solution?
16. Why does copper not liberate hydrogen on reacting with dilute sulphuric acid?
17. Write a chemical equation to show the process of respiration. Mention the type of reaction.
18. Which of the following reactions show evolution of gas.
 - a. $2\text{AgCl} \rightarrow 2\text{Ag} + \text{Cl}_2$
 - b. $\text{Pb} + \text{CuCl}_2 \rightarrow \text{PbCl}_2 + \text{Cu}$
 - c. $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$
 - d. $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$
19. Name 2 metals which get tarnished. Why does this happen ?.
20. Why is corrosion harmful?
21. Mention three situations in daily life where a chemical change occurs.
22. Balance the following chemical equations.
 - a. $\text{H}_2\text{SO}_4 + \text{NaOH} \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$
 - b. $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$
 - c. $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
23. Write chemical equations for the following word equations :
 - a. Hydrogen + Chlorine \rightarrow Hydrogen Chloride
 - b. Sodium + Water \rightarrow Sodium Hydroxide + Hydrogen
 - c. Zinc Oxide + Carbon \rightarrow Zinc + Carbon Monoxide
24. What do you mean by endothermic and exothermic reactions? Give examples.
25. What happens when potassium iodide solution is added to lead nitrate solution? Give equation of reaction and mention the type of reaction involved?
26. How can we make a chemical equation more informative?
27. Write one chemical equation to show:
 - a. Combination reaction
 - b. Decomposition reaction
 - c. Double Displacement Reaction
28. Write short notes on:
 - a. Corrosion
 - b. Rancidity
29. A substance X when mixed with water is used for white washing. The substance X is also formed when a substance Y decomposes.

- a. Identify X and Y and write their formula.
30. Define oxidation and reduction. Give an example of a Redox reaction.