SCIENCE

CHEMICAL Reactions and EQUATIONS

Answer the following question

1) Observe the given equation.

$$\boxed{W}\ Pb(NO_3)_2 \longrightarrow \boxed{X}\ PbO + \boxed{Y}\ NO_2 + \boxed{Z}\ O_2$$

Which numbers respectively will be in the positions W, X, Y and Z when this equation is balanced ?

Ans. : 2, 2, 4, 1. **(2026 March)**

2) $CuO + H_2 \xrightarrow{Heat} Cu\,H_2O$

In this Chemiocal reaction

A) Hydrogeb is reduced to form water
B) Exchange of ions took place between the reaction
C) Copper oxide is oxidized to form copper
D) Copper oxide is reduced to form copper

Ans:-(D) Copper oxide is reduced to form copper **(2025 March)**

3) Equation that represents neutralisation reaction in the following is (2024 March)

(A) $CaO + CO_2 \rightarrow CaCO_3$

(B) $HCl + NaOH \rightarrow NaCl + H_2O$

(C) $2\,Mg + O_2 \rightarrow 2\,MgO$

(D) $Ca + 2\,H_2O \rightarrow Ca(OH)_2 + H_2$

Ans. :

(B) $HCl + NaOH \rightarrow NaCl + H_2O$

4) What is a chemical equation? Illustrate with an example.

Ans:- The mode of communicating facts in chemical language about a chemical reaction is called chemical equation.

Thus a chemical equation is an expression for a given chemical change in terms of symbols of formulae of the reactants and products.

Eg:- the reaction of zinc with dilute sulphuric acid to produce zinc sulphate and hydrogen is given by the following chemical equation:

$$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$$

5) How can we know whether a chemical change has taken place or not?

Ans:- When a chemical reaction occurs, one or more of the following changes take place

(i) Change in state (ii) Change in colour (iii) Evolution of a gas (iv) Evolution (or) absorption of heat (change in temperature)

6) Is burning of a candle wax a physical change or a chemical change?

Ans:- Chemical change.

7) State one basic difference between a physical change and a chemical change.

Ans:- In physical change, no new substance is formed. There is heat change in chemical change and a new substance is formed.

8) How can we justify that a chemical reaction has taken place in the following cases?

i) Burning of magnesium ribbon in air.

ii) Addition of lead nitrate solution to potassium iodide solution.

iii) Addition of dilute hydrochloric acid to zinc granules.

Ans:- i) Burning of magnesium ribbon in air gives a powder of MgO. So there is a change of state and at is produced.

ii) Addition of colourless lead nitrate solution to potassium iodide solution gives yellow coloured precipitate (lead iodide). So there is a change of colour.

iii) Addition of dilute hydrochloric acid to zinc granules gives a gas (H_2) with effervescence and heat is evolved. There is change in temperature.

9) Why should a magnesium ribbon be cleaned before burning in the air?

Ans: Magnesium ribbon should be cleaned before burning in air because Magnesium metal reacts with the atmospheric oxygen and forms Magnesium Oxide (MgO) layer which is a very stable compound. In order to prevent further reactions with Oxygen, it is therefore necessary to clean the ribbon by to remove the layer of MgO.

10) Why is it necessary to obtain a balanced chemical equation?

Ans:- Law of conservation of mass is applied here. Accordingly matter can neither be created nor destroyed. Thus during a chemical reaction the total mass of the reactants and products remains the same. Therefore, for a complete chemical equation, the number of atoms of various elements on both sides are made equal, i.e., the equation is balanced.

11) How is a chemical equation written? Illustrate with an example.

Ans:- Writing of a reaction should be in a systematic manner, using the conventions followed. These are illustrated with the help of an example. Let it be required to write a chemical equation that describes the reaction between magnesium and sulphuric acid to produce magnesium sulphate and hydrogen.

i) Write the symbols of all the substances involved in the reaction-first the reactants and then the products-one after the other ON THE SAME LINE

Reactants **Products**

$Mg \quad H_2SO_4 \qquad MgSO_4 \quad H_2$

ii) Separate the reacting substances from the products by a symbol meaning 'produce'. The sign $\rightarrow$ (an arrow) or sometimes sign = (equal) is used for this purpose.

$Mg \quad H_2SO_4 \rightarrow MgSO_4 \quad H_2$

iii) Then put (plus) + sign between the reactants indicating that these 'react' and a (plus) + sign between the products which signifies 'and',

$Mg + H_2SO_4 \rightarrow MgSO_4 + H_2$

12) What is meant by a skeletal chemical equation? Using suitable chemical reaction, differentiate between a skeletal chemical equation and a balanced chemical equation.

Ans:- If the number of atoms of any element in a chemical equation is not equal on both sides, then it is a skeletal equation.

Eg:- $Mg + HCl \rightarrow MgCl_2 + H_2$

(Contd.....)